House of Commons

Defence Committee

"We're going to need a bigger Navy"

Third Report of Session 2021–22

Report, together with formal minutes relating to the report

Ordered by the House of Commons to be printed 7 December 2021

HC 168
Published on 14 December 2021
by authority of the House of Commons

The Defence Committee

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Summary

The next decade is one of significant risk. Everyone from the National Security Adviser to the Chief of the Secret Intelligence Service agrees that the international security environment is becoming more unstable. This instability is clear in the maritime domain, particularly with the rise of more assertive state adversaries, grey zone warfare and technological risk. At the same time the Royal Navy is being asked to take on increasing responsibilities, including taking the lead for Defence on the Government's persistent engagement policy and Indo-Pacific tilt. What is needed is a realist assessment of capability against government ambition.

However, despite these threats, spending on the Navy and rest of Defence has been capped. Increased defence spending is required to address the numerous issues identified with the Navy's current and future capabilities in this report. Funding is urgently needed to plug the delays and gaps the Navy faces in key capabilities in the next decade.

Government's failure to fund the ha'porth of tar the Royal Navy needs has literally spoiled the ships. The fleet suffers from well documented problems with several key assets:

- Budget cuts have delayed crucial procurement programmes. The Type 23 frigates and Trafalgar class submarines should have been replaced years ago, and it is becoming increasingly challenging and expensive to maintain aging vessels. The Navy has also taken too long to rectify major problems with vessels. One notable example is the issue with the Type 45 destroyers' propulsion system: the six vessels are not scheduled to be fixed until 2028, and there are already signs that this target may be slipping. As a result of these failures too many of our high-end warships spend too much of their time unavailable for operations.

- The latest Spending Review has tightened the Navy's budget for operations and maintenance still further. Once inflation is accounted for the funding available actually falls. This is likely to lead to a reduction on operations and maintenance and the spectacle of yet more ships sitting in port, failing to deter our increasingly emboldened adversaries.

- When ships do get to sea they act like porcupines - well defended herbivores with limited offensive capabilities. This is a result of decisions by successive Governments to limit budgets and prioritise defensive capabilities. What offensive capabilities these ships do have will be reduced even further in three years' time when the Government retires the Harpoon anti-ship missile without a planned replacement. More money must be found to upgrade the Navy's lethality and allow our ships to take the fight to the enemy.

- Harpoon is only one example of the Government prioritising the budget over the strategic situation by cutting key capabilities in the next few years without proper replacements. The Navy will lose medical facilities when RFA Argus

retires in 2024. Under current plans the fleet is also likely to spend several years unable to deliver support shipping and logistics or to monitor critical national infrastructure against interference by hostile states.

- The fleet is increasingly reliant on allies for many capabilities, with a limited scope for sovereign action. The Government needs to be honest about the extent of its sovereign capability and must do more at the political level to ensure the Navy can rely on support from allies.

These significant challenges have not prevented the Navy delivering significant successes, most notably the commissioning of the two aircraft carriers and the 2021 carrier strike group deployment to the Indo-Pacific. However, they do raise concerns about the Navy's ability to deliver the crucial transformations it has planned. To retain a leading edge over adversaries, the Navy must introduce the Naval Strike Network, which is intended to allow information to be shared across the fleet, but which is still ill defined, despite related systems being supposed to enter service in the middle of this decade. This is a crucial omission.

Towards the end of the decade in 2027–28 the Navy will begin transitioning multiple classes of vessel simultaneously. Crucially these plans must be delivered on schedule in order for the Navy to exit the period of risk that budgetary restrictions have placed it in. However, they face many structural and project-specific risks, and the Ministry of Defence's track record on delivery is far from good.

Whenever we have investigated a failure, we have heard the customary mantra that "lessons have been learned". Not only do we seriously doubt that this is the case, these projects are too important to the Navy's credibility and the UK's security to be treated as a learning opportunity. These projects therefore need greater scrutiny from Parliament and external stakeholders, and this requires the Government to be honest about its intentions and publish shipbuilding delivery plans.

In short, over the next five years or so, at least until the new classes of surface escorts come on stream, the Royal Navy will be asked to do even more with even less. This is a clear risk, which those beyond these shores can calculate just as readily as we can.

As we look to the future, the Navy's fleet is too small and too specialised to meet the demands that will be placed on it over the next two decades. The escort fleet needs to double in size by acquiring more low-end capability to carry out low end tasks, alongside ships capable of carrying out the Navy's high-end warfighting commitments. Attack submarine numbers should also grow to reflect the growing importance of the subsurface domain. Funding, personnel and support shipping must grow commensurately.

To deliver these new ships, the UK requires a strong domestic shipbuilding capability. Many current issues are the result of previous Governments refusing to accept the consistent recommendations that have been given by a variety of experts for the last fifteen years: provide a steady pipeline of work for British shipyards, prioritise building vessels in the UK, work collaboratively with industry, and promote exports. So far, the Government has not fully committed to following this advice: the refresh of the National Shipbuilding Strategy must change this. Properly supported, the UK's shipbuilding industry must be able to deliver the new technologies that future vessels

will need: modularity that can immediately add new capabilities to vessels and keep them upgraded with the latest equipment, autonomous vehicles that will expand the range and opportunity for a vessel to see or strike an adversary, and distributed operations that allow the whole fleet to share information and coordinate action. This will require significant investment in yard modernisation.

1 Context of the Inquiry

Our Inquiry

1. The result of the Integrated Defence and Security Review (IR) and the deployment of the carrier strike group to the Indo-Pacific have drawn additional attention to the Royal Navy this year. As part of our inquiry into the outcomes of the IR, we held an oral evidence session on 13 April 2021 focusing on what it meant for the Navy. We took evidence from Dr Sidharth Kaushal, Research Fellow, Sea Power at Royal United Services Institute (RUSI), and Rear Admiral (retd) Alex Burton, former Commander, UK Maritime Forces (2016–2017) and Director, UK Pathfinders at Rebellion Defence. At that session we resolved to launch an inquiry into the Navy's capabilities.

2. Our predecessor committees addressed questions of naval procurement and capabilities, including in a 2016 report on "Restoring the Fleet: Naval Procurement and the National Shipbuilding Strategy". This report was completed before the National Shipbuilding Strategy (NSbS), and also predates other significant developments in naval and shipbuilding policy, including the decision on the Type 31 programme, the delivery of the aircraft carriers and the IR and Defence and Security Industrial Strategy (DSIS). Reports on "Future Anti-Ship Missile Systems: Joint inquiry with the Assemblée nationale's Standing Committee on National Defence and the Armed Forces" and "Sunset for the Royal Marines? The Royal Marines and UK amphibious capability" were both produced in 2018. Last year we also began an inquiry into "Defence industrial policy: procurement and prosperity", and we have drawn on the evidence we received as part of that inquiry to inform our conclusions in this report.

3. This inquiry examines whether the Government's ambitions for the Navy are adequately matched by the Navy's current and planned capabilities and the procurement systems that deliver those capabilities. The inquiry did not examine the logic behind Government ambitions for the Navy, technical issues relating to the design of individual platforms, or questions of personnel.

4. Our inquiry was launched on 23 April 2021 and over the course of it we have accepted 42 pieces of written evidence and heard oral evidence from witnesses across four sessions.

5. As part of our work, we visited BAE Systems Submarine's operations at Barrow and saw progress on the Astute and Dreadnought submarine programmes. We have also resolved to visit Babcock's shipyard in Rosyth and BAE Systems' shipyard in Govan in the new year to continue the work begun in this inquiry.

6. We are grateful to Alex Burton, who served as a Specialist Adviser on the inquiry after giving evidence at the 13 April oral evidence session.[1]

1 As a Specialist Adviser, Rear Admiral Burton declared his work at Rebellion Defence Ltd, a UK-US Defence Software company, as an interest.

2 The Royal Navy's Role

The Security Environment

7. The security environment informs the Navy's mission and the force structure. This environment is becoming more complex and less stable; and these trends are likely to continue in the next five to ten years. Richard Moore, Chief of the Secret Intelligence Service, said in his first public speech "we are living through an era of dramatic change in the security landscape." Witnesses to this and other inquiries, including the Government and the National Security Adviser, have agreed with this assessment.[2] The then First Sea Lord and current Chief of the Defence Staff, Admiral Sir Tony Radakin, told us that this was "definitely" true for the maritime environment and that there was also an increase in the number and severity of state threats. Dr David Blagden, Senior Lecturer in International Security, University of Exeter, predicted that the growing power of adversaries would introduce new challenges for the Royal Navy, including potentially having to fight for control of the sea or deny adversaries access to our own waters.[3] These are increasingly manifesting in the so-called 'grey zone', while rapidly changing technology is also shaping the maritime security environment.

Principal State Adversaries

8. Witnesses have consistently identified Russia and China as the main adversaries in the maritime domain (as well as elsewhere). Rear Admiral Burton and Dr Kaushal both agreed that "the foremost threat is clearly the pacing threat posed by Russia." However, Dr Kaushal, among others, warned that in a 10-year timeframe China could overtake Russia to become the primary challenge as it is economically more dynamic.[4] Geoffrey Till, Professor of Naval History and Strategy, US Naval War College, agreed, and noted the interaction between the two, saying:

> Coping with the slightly longer term Chinese global challenge will position us well to deal with the immediate regional challenge posed by Russia.[5]

Even those witnesses who were sceptical of the effect the UK could have on security in the Indo-Pacific agreed that the challenge China posed to UK interests was growing.[6]

Grey Zone Conflicts

9. Although the potential for high-end warfighting with these and other adversaries persists, former Chief of the General Staff, Lord Houghton told us, "It is the grey-zone threats that are the up arrow." This is specifically true of the Indo-Pacific, where the Government intends to increase the UK's presence in the coming decade. Former Australian Defence Minister Christopher Pyne and Professor Tetsuo Kotani, Professor of

2 "Human Intelligence in the Digital Age", Richard Moore, 30 November 2021; Q189; Q120; Oral evidence taken on 23 March 2021, HC (2019–21) 1333, Qq3–14; Oral evidence taken on 30 November 2021, HC (2021–22) 166, Q280.

3 Q190; Dr David Blagden (Senior Lecturer in International Security at University of Exeter) (NAV0020)

4 Oral evidence taken on 13 April 2021, HC (2019–21) 1333, Qq65,73. Dr Rob Johnson, Director of the Oxford Changing Character of War Centre, also agreed, predicting that the next decade was crucial to how the UK responded to China (Oral evidence taken on 2 March 2021, HC (2019–21) 1187, Q52).

5 Professor Geoffrey Till (Dudley Knox Chair of Naval History and Strategy at US Naval War College) (NAV0022)

6 Oral evidence taken on 2 March 2021, HC (2019–21) 1187, Q53; Dr David Blagden (Senior Lecturer in International Security at University of Exeter) (NAV0020)

Global Studies, Meikai University, described the region as being more dangerous than five years ago. They warned that China would use grey zone activity to expand its jurisdiction in neighbouring waters, even though the likelihood of China taking direct military action against a UK or allied vessel or using force against a neighbouring country was "extremely limited".[7]

Box 1: What is Grey Zone Activity in the Maritime Domain?

UK Strategic Command describes the grey zone as: "The idea is that a completely benign or peaceful action carried out by a group or nation can be defined as "white". Whereas a clearly hostile action, which could be seen as an act of war, can be defined as "black". So, with that in mind, anything between these would be "grey". The grey zone is a murky area, consisting of everything which isn't full-on conflict, but isn't exactly an innocent act either."

A paper on grey zone threats from US Special Operations Command notes that they are "characterised by ambiguity about the nature of the conflict, opacity of the parties involved, or uncertainty about the relevant policy and legal frameworks."

Rear Admiral Burton gave some examples of the actions that could be used in the grey zone to threaten and coerce the target to get them to act in a certain way: cyber-attacks, particularly on critical national infrastructure; embarrassing military units; exploiting the media narrative to allege wrongdoing by a target; or taking advantage of the strategic narrative.

In the maritime domain examples of grey zone activity might include: deliberate intrusions by military, civil authority or private commercial vessels to dispute other nations' claims to territory or territorial waters (for example incursions by Chinese naval, Coast Guard or fishing vessels into disputed waters around the Senkaku/Diaoyu islands); passing other vessels at closer than safe distances or harassing them; or the use of government controlled fishing fleets to take small islands (as in the Chinese takeover of the Paracel Islands in 1974). Notably, because the grey zone covers the whole area between war and peace, some experts also define it to include activity much closer to the white, or peace time, end of the spectrum: examples might include freedom of navigation operations, which the UK has committed itself to conducting in the Indo-Pacific, or disputes over jurisdiction between otherwise strong allies, like activity by Spanish police vessels in Gibraltar's territorial waters.

Source: Strategic Command "Getting to Grips with the Grey Zone", 26 April 2021; US Special Operations Command "The Gray Zone", October 2015; Oral evidence taken on 13 April 2021, HC (2019–21) 1333, Q82; Australian Strategic Policy Institute, Grey Zone Operations and the Maritime Domain (October 2018), pp 5,11

10. Dr Kaushal described maritime grey zone operations as having two purposes: shaping the operating environment for future military operations, and staking territorial claims.[8]

11. Activity moving to the grey zone does not allow the UK to neglect conventional naval forces. Dr Kaushal described the grey zone and high-end warfighting as two ends of a spectrum of competition. Responding to a grey zone threat may not be limited to fighting in the grey zone itself and will still require strong conventional forces. Dr Blagden notes that the conventional deterrence of a fleet of capable vessels, able to inflict significant costs on an enemy, deters adversaries from escalating too far within or beyond the grey zone.

7 Oral evidence taken on 23 March 2021, HC (2019–21) 1333, Q17; Dr Alessio Patalano (NAV0036) and techUK (NAV0012) also agreed with the growing relevance of grey zone threats; Qq126–127

8 Dr Sidharth Kaushal (NAV0037)

Rear Admiral Burton also stressed that, "if we are to win in the grey zone, we have to be able to show credible deterrence, and to show credible deterrence, we have to be able to deliver a credible retribution when required."[9]

The Role of Technology

12. Technology is also changing the character of naval warfare. Written evidence notes that new technologies are being adopted by hostile actors across the world, introducing new threats to the fleet. The Society of Maritime Industries told us that examples of technology the Navy is not yet prepared for include hypersonic anti-ship cruise missiles, electromagnetic rail guns and directed energy weapons, cyber and electromagnetic attack, CBRN threats and asymmetric drone attacks.[10]

13. We heard that the Navy could improve its response to such technologies in part by increasing its own digital and data sharing capabilities, particularly through the digital integration of assets. Thales told us that missile defence requires the use of real-time information to enable an instant reaction to a threat, as well as the regular upgrading of systems, sensors and counter measures like surface-to-air missiles and close-range air defence. This is because "anti-ship missile technology is now at the point that even at extremely long ranges, a single missile hit probably now represents a definitive kill."[11] We were also told the offensive focus is shifting from individual vessels' power to the fleet's overall ability to deliver capabilities and execute a "kill chain" (the actions required to locate and destroy an adversary) through a variety of assets. Professor Jonathan Caverley, Professor of Strategy, US Naval War College, said:

> This might be obvious to the Committee, but it bears repeating. You can have every tube in a ship full, but if you can't close the kill chain with sensing, computing and command and control, there is no point to it. Every missile is very expensive, not just because the missile is expensive, but because the reconnaissance strike complex needed in order to get that missile where it needs to go needs to be invested in as well.[12]

14. Enabling this real-time information sharing and kill chain requires integration of assets, which, as the names suggest, is a key part of the IR and the Integrated Operating Concept.[13] This concept of integration includes the ability to coordinate activity not only within the Navy, but also with other UK forces, with other branches of government and with allies. We assess the Navy's digital integration and use of technology in Chapter 3.

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9 Dr David Blagden (Senior Lecturer in International Security at University of Exeter) (NAV0020); Oral evidence taken on 13 April 2021, HC (2019–21) 1333, Q83

10 techUK (NAV0012); Human Security Centre (NAV0025); Dr David Blagden (Senior Lecturer in International Security at University of Exeter) (NAV0020); Society of Maritime Industries (NAV0032)

11 Thales UK (NAV0018)

12 Q18

13 The Integrated Operating Concept is Defence's conceptual approach to the use of armed warfare in an era of strategic competition and a rapidly evolving character of warfare. It lays out how Defence believes it can and should create multiple dilemmas that unhinge an adversary's understanding, decision-making and execution. The concept states that for Defence to drive the strategic tempo and deliver a range of options to politicians to respond to and threaten adversaries there needs to be integration across the forces, domains, and UK national capabilities and with allies. (Ministry of Defence, "The Integrated Operating Concept", p5, Ministry of Defence, "The Orchestration of Military Effects", January 2021, 1.6–1.7). Professor Greg Kennedy (Professor of Strategic Foreign Policy and Director of the Corbett Centre for Maritime Policy Studies at King's College London) (NAV0005) and Professor Geoffrey Till (Dudley Knox Chair of Naval History and Strategy at US Naval War College) (NAV0022) were both supportive of more integration like this.

15. Several witnesses also cautioned us about the growing threat posed by hypersonic missiles. Witnesses consistently warned that hypersonic weapons would proliferate in the future and the Royal Navy would soon have to develop a way to manage a threat for which it was currently under prepared.[14]

16. **Over the next decade the UK and the Navy will face an increasingly complex international security environment. Russia and China will remain the primary adversaries at sea, with the relative importance of the UK's response to each likely to shift and potentially interact through the decade. Developments in technology, particularly in hypersonic weapons, are changing the conduct of naval warfare and grey zone operations are becoming increasingly important for the UK's security in the maritime domain, as they are in others.**

The Navy's Missions

17. The IR has given the Royal Navy an increased (potentially the leading) role in the UK's global security posture, with Rear Admiral Burton describing it as "probably the most ambitious vision of the three services".[15] The importance of the Navy in the IR was demonstrated by the fact that two of the three priority actions in the defence of the UK and its citizens are naval missions.[16]

18. The map on the next page shows the Navy's standing tasks and permanently assigned vessels that are outlined in the IR, Defence Command Paper (DCP) and Ministry of Defence's written evidence to this inquiry:

14 ADS (NAV0015); Cllr. Anthony Linden (NAV0024); Human Security Centre (NAV0025); Society of Maritime Industries (NAV0032); Gabriele Molinelli (NAV0002); Mr Christopher Cope (Parliamentary Correspondent at Warship World/ Navy Books) (NAV0007); Lockheed Martin UK (NAV0011); Professor Trevor Taylor (Director, Defence, Industries & Society Programme at RUSI) (NAV0013)

15 Oral evidence taken on 13 April 2021, HC (2019–21) 1333, Q64

16 HM Government, "Global Britain in a Competitive Age: The Integrated Review of Security, Defence, Development and Foreign Policy", CP 403, March 2021, section 3.1.1 para 12 identifies three priority actions, two of which (securing British territory against physical incursions and supporting Overseas Territories in deterring and defending against state and non-state threats) are likely to be primarily maritime. The description of these three missions mentions the Navy or maritime operations three times, the RAF once and the "armed forces" in general twice.

Navy Missions Map

Source: Ministry of Defence (NAV0030); Ministry of Defence, “Defence in a Competitive Age”, CP 411, March 2021. 4.5, 4.8, 4.9, 5.7, 5.14, 5.22, 7.21, 7.22, 7.25; “High-tech, low cunning: moving towards the sharp end of the Integrated Review”, Michael Clarke, Tipping Point, 21 March 2021; “British warships extend their northern reach for Barents Sea drill”, Defense News, 10 September 2020; Dr Sidharth Kaushal (NAV0037); The Lowy Institute, “Moscow’s other navy”, 21 June 2018; IISS, “The GIUK Gap’s strategic significance”, October 2019; HM Government, “Global Britain in a Competitive Age: The Integrated Review of Security, Defence, Development and Foreign Policy, 3.1.1 para 12, p92, 3.3.2 para 25, p93; Royal Navy, “First Sea Lord’s Summer Address”, 29 July 2021

Table 1: The Royal Navy's Missions and Deployments

Task 1	Operating and protecting the Continuous At-Sea Deterrent (CASD).
Task 2	Regular naval patrolling with NATO and projecting UK forces into NATO's flanks, in particular the High North and Arctic, the Baltic Sea, the Balkans, the Mediterranean and the Black Sea. Professor Michael Clarke, former Director, RUSI, reports that the Navy intends to "give the Kremlin something to think about in its own backyard."
Task 3	Maintaining operational advantage in the North Atlantic (particularly under water), underpinned by deep interoperability with allies. This has historically focused on defending and preventing Russian access through the GIUK gap, the waters forming a strategic transit route between Greenland, Iceland and the UK. A paper by IISS notes that "After a long period of post-Cold War neglect, the GIUK Gap has returned as one of NATO's major strategic maritime concerns and features prominently in the calculations of others–especially the Russian Navy" and notes that "NATO maritime commanders have warned of an increase in Russian submarine activity to levels not seen since the end of the Cold War." In response, the US and NATO are increasing the maritime, particularly anti-submarine, assets devoted to the area. IISS and Dr Kaushal have noted that although the Russian submarine is prioritising sea denial and long range strike capabilities over interdicting Atlantic sea lines of control, and may not even need to transit the GIUK gap to launch strikes on critical alliance infrastructure, it must be assumed that "this mission is at least part of Russia's repertoire", especially as the country aspires to a blue water fleet, and in a conflict the GIUK gap could still serve as a front line even if Russian submarine assets were clustered to the North. In addition, the threat continues to evolve as Russia's Main Directorate of Deep-Sea Research (GUGI) fields special purpose submarines that can interfere with underwater infrastructure in the area.
Task 4	Escorting foreign warships through UK waters. The "Fleet Ready Escort" role (defined by the MoD as "a warship held at short notice in home waters that is ready to react when required in support of homeland defence and other maritime security duties") will be largely filled by frigates and Offshore Patrol Vessels (OPVs), although the MoD hopes that improved Type 45 availability from 2023 will provide more capacity to meet this and other commitments.
Task 5	Protecting the UK's Exclusive Economic Zone, including undersea critical national infrastructure and fishery activity control, search and rescue and customs enforcement.
Task 6	Safeguarding Overseas Territories and Crown Dependencies and deterring and defending against state and non-state threats.
Task 7	Collaborating with law enforcement and security and intelligence agencies to protect the UK and the Overseas Territories from illegal and dangerous activity, including serious and organised crime and terrorism.
Task 8	Securing key maritime choke points to support the flow of trade, and to uphold international norms. The Maritime Component Command in Bahrain will continue to ensure the flow of trade in the Gulf, including through support to part of the new International Maritime Security Construct. The Navy will continue freedom of navigation operations in the Black Sea, in strict accordance with the Montreux Convention, both through NATO and on stand-alone deployments.

Task 9	Contribute to counter-trafficking operations and deliver humanitarian and disaster relief during the annual hurricane season in the Atlantic and Caribbean.
Task 10	Tackling piracy off the Gulf of Guinea.
Deployment 1	Permanently stationing an OPV in Gibraltar.
Deployment 2	Permanently stationing an OPV in the Caribbean.
Deployment 3	Two OPVs will be permanently stationed in the Indo-Pacific for the next 5 years. The MoD's current planning assumption is that these will be replaced by Type 31 when they enter service.
Deployment 4	Permanently station an OPV in the Falklands.
Deployment 5	Provision of high readiness forces, including a carrier strike group and Littoral Response Group North, to NATO, at 30 days notice to move.
Deployment 6	Littoral Response Group South (beginning 2023) will operate out of Duqm, Oman.
Deployment 7	"Regular drumbeat" of carrier strike group deployments to the Indo-Pacific.
Deployment 8	Annual seasonal Antarctic patrols by Ice Patrol ship, HMS Protector, to ensure compliance with the Antarctic Treaty System.

Source: Ministry of Defence (NAV0030); Ministry of Defence, "Defence in a Competitive Age", CP 411, March 2021, 4.5, 4.8, 4.9, 5.7, 5.14, 5.22, 7.21, 7.22, 7.25; "High-tech, low cunning: moving towards the sharp end of the Integrated Review", Michael Clarke, Tipping Point, 21 March 2021; "British warships extend their northern reach for Barents Sea drill", Defense News, 10 September 2020; Dr Sidharth Kaushal (NAV0037); The Lowy Institute, "Moscow's other navy", 21 June 2018; IISS, "The GIUK Gap's strategic significance", October 2019; HM Government, "Global Britain in a Competitive Age: The Integrated Review of Security, Defence, Development and Foreign Policy", CP 403, March 2021, 3.1.1 para 12, p92, 3.3.2 para 25, p93; Royal Navy, "First Sea Lord's Summer Address", 29 July 2021

19. Since the IR was published, proposals have also arisen for the Navy to support Arctic defence through assistance to Canada. This might include taking part in cold weather exercises or deploying an attack submarine.[17]

20. We received no evidence of the advantage to the Royal Navy of acquiring the National Flagship. The £200-£250 million capital cost (the cost of a Type 31 frigate), combined with running costs (expected to be £20–30 million annually along with the need to provide a ship's company of 50–60) will be an ongoing pressure on an already constrained naval budget. The Minister for Defence Procurement admitted that the National Flagship will require an escort for some visits, for example if it wanted to replicate the deal signed with Ukraine as part of the carrier strike group: this will add another mission to an already busy fleet.[18]

The White Ensign in the Grey Zone

21. The significant number of missions given to the Navy is in line with the focus the IR places on persistent engagement as a response to competition below the threshold of warfare and grey zone threats. The IR says that persistent engagement means deploying UK forces "overseas more often and for longer periods of time to train, exercise and operate alongside allies and partners". These forces' missions will include building these partners' defence capabilities and helping them to counter non-state threats.[19]

17 "Britain offers Canadian military help to defend the Arctic", CBC, 24 September 2021

18 Qq208–226

19 HM Government, "Global Britain in a Competitive Age: The Integrated Review of Security, Defence, Development and Foreign Policy", CP 403, March 2021, p75

22. We heard that in general navies are well positioned for persistent engagement as their traditional role includes both war-fighting and a responsibility for peace time maritime security (counter-piracy, monitoring trade routes etc). As Professor Caverley described: "[W]hat makes navies unique from other services is the vast and massive peacetime role they play. The point of a navy is to go to sea in war and in peace."[20]

23. Professor Steven Haines, University of Greenwich, also notes that:

> Navies traditionally had four notable functions in war and peace that were well-defined in naval doctrine … [controlling the sea, projecting power from sea to land, interdicting or defending trade, and maritime constabulary duties like preventing piracy or illegal trade and fishing]. The first are essentially wartime roles while the fourth has been regarded as essentially a peacetime activity. Here one must acknowledge that the clear traditional distinctions between 'war' and 'peace' seem no longer to be appropriate, with so-called 'grey-zone' and 'hybrid' forms of warfare presenting clear challenges at and around the 'threshold'.[21]

24. Delivering persistent engagement requires an increase in vessel numbers. Sir Philip Jones, a former First Sea Lord, told us that although the Navy had demonstrated that many presence roles that would have traditionally been assigned to a frigate could be filled by OPVs, amphibious ships or the Royal Fleet Auxiliary,

> the great thing that the Integrated Review does is recognise that that uplift in tasks and missions and, in particular, forward deployed persistent presence is eventually going to have to lead to a bigger fleet to be able to do it more effectively on a sustained level.[22]

The Navy in the Indo-Pacific

25. The IR concludes that the UK needs to engage more deeply in the Indo-Pacific as "it is critical to our economy, our security and our global ambition to support open societies." The Government's activity in the region is largely focused on trade but the IR also promises action towards "strengthening defence and security cooperation, including in maritime security". The Navy has taken the lead for Defence on the Indo-Pacific tilt, with the deployment of Carrier Strike Group 21 (CSG21) and two OPVs (HMS Tamar and HMS Spey) to the region. This commitment will be continued with plans to position Littoral Response Group (South) (a force of Royal Marines, amphibious assault ships and support elements) and continue "a regular drumbeat of CSG deployments" in the region.[23]

26. Witnesses highlighted that the decision to operate in the Indo-Pacific is a significant shift, as the vast size of the maritime domain makes the region very different from the Atlantic. Professor Caverley told us:

20 Q1
21 Steven Haines (NAV0033)
22 Q12
23 HM Government, "Global Britain in a Competitive Age: The Integrated Review of Security, Defence, Development and Foreign Policy", CP 403, March 2021, pp66–67; Ministry of Defence (NAV0030)

> It is somewhat counterintuitive, but maritime territory has a terrain. There is really no substitute for being in the region. The water looks the same everywhere, but the Pacific works differently to the Atlantic.[24]

27. Sir Philip Jones concurred:

> We first need to get our head around the geography involved in [the Indo-Pacific], how you do logistic support, how you build alliances and partnerships and how you reflect on the fact that there is no real NATO out there to standardise tactics, techniques and procedures among allies. How do you most effectively integrate and build on the partnerships that we already have?[25]

Mr Pyne suggested that one way the Royal Navy could enhance its knowledge of the region would be partnering with local navies.[26]

28. Many witnesses agreed that the Navy would need to prioritise establishing sustainment and logistics in the region. The Department has announced that the OPVs deployed to the region will not have fixed home ports but will instead refit in local ports as necessary. Dr Alessio Patalano, King's College London, supported this decision, arguing that the two OPVs have light logistical requirements and high operational flexibility and that a flexible approach is supported by regional leaders. He notes that establishing this logistical support will require defence staff at UK embassies to be much more active, in line with the expansion of the defence diplomacy network described in the DCP.[27]

The Value of the Indo-Pacific Tilt

29. There has been an active debate among witnesses who have given evidence to this and other inquiries about the value of the Indo-Pacific tilt. As noted above, our witnesses consistently agreed that China was likely to emerge as the main risk to UK interests in the next decade, but they disagreed over whether the deployment of UK naval assets to the region would the most effective use of military resources to counter this.

30. Professor Greg Kennedy, Professor of Strategic Foreign Policy, King's College London, put the case against deployment to the Indo-Pacific most strongly:

> The question of the impact of the Indo-Pacific is relatively simple: it is a distraction and costly prestige exercise that will have no significant impact, apart from a fleeting appreciation from the USN… The cost of operating beyond the Straits of Hormuz are not profitable in any sense: pounds, politics or prestige, in comparison to what is lost, or, indeed what greater threat or friction is created. The pursuit of American ties should not be

24 Q4
25 Q4
26 Q142
27 Professor Greg Kennedy (Professor of Strategic Foreign Policy and Director of the Corbett Centre for Maritime Policy Studies at King's College London) (NAV0005); Miss Angie Hesham Abdo Ahmed (Postgraduate reseracher at University of Hull) (NAV0016); Professor Geoffrey Till (Dudley Knox Chair of Naval History and Strategy at US Naval War College) (NAV0022); Society of Maritime Industries (NAV0032); Policy Exchange "A Very British Tilt", 2021; "Why is a British Carrier Strike Group heading to the Indo-Pacific?" Alessio Patalano, War on the Rocks, 11 August 2021; For submarine logistics and support in particular, Professor Kotani noted that there may be a future opportunity, if the AUKUS deal gives Australia nuclear submarines and the relevant repair and maintenance capability, for the country to support the UK's own submarines (Q109).

> at the expense of unnecessarily provoking, beyond carefully considered strategic lines, either Chinese or other regional displeasure due to a fleeting and uncertain naval presence. The use of legal means, political, economic or trade policies, along with other sources of strategic signalling and leverage, can all be used more effectively to both provide assurance and deterrence in the region. As well, potential and real allies are not impressed by a token presence in the area. Such pretentious and insubstantial contributions to the region run the risk of raising old anti-imperial and anti-colonial emotions that are still powerful in the region and which would resonate badly with an already unsettled UK domestic situation. Therefore, the juice is not worth the strategic squeeze to spread already thin naval energy for little effect.[28]

31. Several witnesses argued that the UK could best contribute to allied operations in the Indo-Pacific by substituting for US capabilities in Europe. Dr Blagden argues that the Western Pacific "is the crucible of twenty-first-century great-power politics, and therefore crucially important, but best handled by the United States and its capable regional allies (Japan, South Korea, Australia, etc) while European NATO states focus on securing Europe (lightening Washington's non-Asian burdens in the process)." Professor Wyn Rees, Professor of International Security, University of Nottingham, agreed, specifically noting the amount of time it would take for UK naval forces to travel to the region.[29]

32. However, several witnesses have argued in favour of the Navy's role in supporting the rules-based international order and law of the sea in the region as part of the UK's wider tilt to the Indo-Pacific.[30] For example, Dr Rob Johnson, Director of the Oxford Changing Character of War Centre, suggested that additional UK contributions to European defence beyond planned support to NATO in the High North would not be as impactful as a UK presence in the Indo-Pacific.[31]

33. Sir Philip Jones also supported a considered UK role in both the Indo-Pacific and Atlantic. He warned that the UK must not "get carried away with that to such an extent that you neglect that you are an Atlantic region" but that, conversely, it could no longer focus on the Euro-Atlantic to the exclusion of the Indo-Pacific:

> I don't think it is necessarily a zero-sum game. … It is about working with allies and partners to say, "Where can we most effectively apply the capabilities that we have?"[32]

34. Sir Philip told us that when he was First Sea Lord Indo-Pacific nations had regularly called for the UK to be present in the region. Professor Kotani and Mr Pyne agreed that Japan and Australia welcomed CSG21's presence. Mr Pyne told us it was important "for all countries, but particularly countries like the UK, to indicate to China that we do not

28 Professor Greg Kennedy (Professor of Strategic Foreign Policy and Director of the Corbett Centre for Maritime Policy Studies at King's College London) (NAV0005)

29 Dr David Blagden (Senior Lecturer in International Security at University of Exeter) (NAV0020); Oral evidence taken on 2 March 2021, HC (2019–21) 1187, Q53

30 Miss Angie Hesham Abdo Ahmed (Postgraduate reseracher at University of Hull) (NAV0016); Mr Robert Clark (Research Fellow, Global Britain Programme at Henry Jackson Society) (NAV0038)

31 Oral evidence taken on 2 March 2021, HC (2019–21) 1187, Q52

32 Q29, Q4, Q7

recognise its claims over the South China Sea as being any greater or lesser than the other countries that border the South China Sea, whether it is Vietnam, the Philippines, Brunei or others."[33]

35. Professor Kotani and Dr Kaushal warned us that the transient presence of a carrier strike group can only achieve limited effects. However, they noted that the UK can still make an effective contribution to regional security by joining collective responses with allies when adversaries breach accepted norms. Dr Kaushal proposes using information gathering and monitoring to add to maritime domain awareness and impose reputational costs for any infractions. He suggested the OPVs could bring civilian actors from across or beyond government to publicly verify claims of, for example, illegal fishing. These two witnesses also suggested that the UK could help local partners with less experience but greater local mass build institutional capacity. Examples include the Littoral Response Group (South) helping partners build resolve and resilience.[34]

The Practicalities of the Indo-Pacific Tilt

36. Some witnesses doubted that the UK has sufficient capabilities to operate in the Indo-Pacific. General Lord Richards, former Chief of the Defence Staff, questioned whether the Indo-Pacific tilt was militarily deliverable:

> I am worried that global Britain, as much as I am with it in principle as a patriotic chap, is not deliverable in defence terms, and we ought to be centring our effort on NATO and the Euro Atlantic area, which are militarily deliverable and hugely strategically influential, and not risk penny packaging our more limited forces around the world and not necessarily gaining any extra influence, because they do not have the sufficient mass in any particular place to gain that influence.[35]

37. However, Lord Richards noted that his advice was based on the understanding that the Royal Navy will only have the resources to deploy one carrier at a time; he was concerned that there might be a need for a carrier in the UK in the middle of a deployment to the Indo-Pacific. Admiral Radakin has since advised us that the Navy intends to always be able to deliver a sovereign core of one carrier and one air wing operating using only UK assets, leaving open the possibility that a second carrier could be operated simultaneously with assistance from allies (although this would present additional challenges of its own). The uncertainty around the Department's plans for the carrier and the F-35s is explored further in Chapter 3.[36]

38. Dr Kaushal expressed support for the current plans, but warned that changes in the future might expose the Navy to risks it could not match:

> There is a possibility that if the tilt to the Indo-Pacific becomes a pivot—if for example accession to the [Comprehensive and Progressive Agreement for Trans-Pacific Partnership trade agreement] raises the profile and the importance of the Indo-Pacific in the future, if not quite now, to British grand strategy—naval resources that are currently very well appropriated

33 Qq121–123
34 Dr Sidharth Kaushal (NAV0037); Q130
35 Oral evidence taken on 23 March 2021, HC (2019–21) 1333, Q29
36 Oral evidence taken on 23 March 2021, HC (2019–21) 1333, Q36; Q276

> in accordance with the level of the threat and the importance allocated, might find themselves stretched a bit thinner than they are now. If, for example, the CSG is required to operate more frequently in the Indo-Pacific, this might create trade-offs with the primarily NATO-oriented focus that the integrated review has laid out, which makes perfect sense today but is perhaps vulnerable to geopolitical headwinds.[37]

Dr Blagden also expressed similar concerns, noting the risk of "penny packeting", in which UK forces would be spread too thinly to effectively protect themselves.[38]

39. Witnesses flagged up the limits of the two OPVs that will be deployed to the region. The Human Security Centre told us that neither the River Class nor the Type 31s that are planned to replace them "are 'high-end' vessels with significant independent warfighting capabilities"[39] and Dr Patalano calls the OPVs "sufficient for a persistent form of Indo-Pacific engagement, albeit one optimised for presence more than combat missions". Admiral Radakin confirmed that the OPVs' deployment "is not to pretend that these are high-end warfighting ships—they do not have the armament for that—but they do signal our commitment to the region". He said that their tasks would be focused on constabulary operations, including responding to humanitarian disasters, policing exclusive economic zones and maritime protected areas, and practicing missions like boarding actions with local navies.[40]

Fitting Capabilities to Missions

40. The Society for Maritime Industries told us:

> The requirement to deliver Carrier Strike, Littoral Strike and the standing commitments outlined above and combat the expected threats will require a full spectrum of capabilities and a larger Navy, even with the force multiplier effect expected from increased adoption of autonomous systems and the innovative use of technology.[41]

41. Dr Basil Germond, Lancaster University, noted that the Navy has a capability gap in the smaller ships required to perform constabulary and defence engagement tasks:

> The concern is not the lack of power projection capabilities (which has been addressed with the new aircraft carriers) but the lack of capabilities to fulfil the lower spectrum of missions assign[ed] to the Navy.[42]

The Human Security Centre also argues that "low-cost systems capable of generating mass and enduring attrition" will be crucial, along with other innovative technologies to avoid detection and enhance mobility.[43]

37 Oral evidence taken on 13 April 2021, HC (2019–21) 1333, Q66
38 Dr David Blagden (Senior Lecturer in International Security at University of Exeter) (NAV0020)
39 Human Security Centre (NAV0025)
40 Dr Alessio Patalano (NAV0036); Q268
41 Dr David Blagden (Senior Lecturer in International Security at University of Exeter) (NAV0020); Dr Basil Germond (Senior Lecturer at Lancaster University) (NAV0004); Q269; Society of Maritime Industries (NAV0032);
42 Dr Basil Germond (Senior Lecturer at Lancaster University) (NAV0004)
43 Human Security Centre (NAV0025)

42. In addition, the UK must fulfil its obligations to NATO, in particular the Joint Expeditionary Force, while also managing the requirements of the tilt to the Indo-Pacific. This requires the Navy to maintain not only the numbers of hulls in the fleet but also a high-end warfighting capability, including in the North Atlantic.

43. Admiral Radakin told us that the Navy would double the number of sailing days for frigates and destroyers in order to fulfil all the missions prescribed for it in the IR. However we were unconvinced by his plans to achieve this by purchasing only five additional Type 32 frigates and relying on an increase in the availability of the escort fleet from 60% to 80%. Relying on higher availability as the main solution to deliver more vessels has significant limitations. Vessels often break down unexpectedly. Surges in the number of available vessels require planning and a decrease in availability at other times to compensate; this means it may not be possible to surge vessels to respond to unexpected crises or without abandoning other missions. In addition, as explained in Chapter 3, recent improvements in vessel availability have largely come from improvements to significantly less capable patrol vessels. This has obscured very low availability levels in frigates and destroyers, the classes of vessel that need to increase availability significantly to deliver the Navy's plan. Admiral Radakin indicated that improving availability for higher end vessels like destroyers is significantly more challenging as the crewing models that have improved the availability of other classes of ships are not feasible for them.[44]

44. Expanding the fleet in this way will require increased spending on shipbuilding for the long term. Witnesses have noted that a major expansion to the fleet could not come without significant additional funding. Dr Germond told us the UK fleet is probably at the limits of what is possible with its budget. Rear Admiral Burton went further and questioned whether the budget was sufficient to deliver the vessels and the technological innovation required.[45]

45. **The Government has ambitious plans for the Royal Navy. The Integrated Review has given the Navy a significantly increased, and potentially the leading, role in the UK's security posture. It is likely to be the Government's tool of choice to deliver its strategy of persistent engagement and competition below the threshold of warfare. As a result, the Navy must be able to deliver constabulary and presence operations for peace time maritime security, while still able to perform high-end warfighting functions effectively, including upholding NATO taskings and other international agreements.**

46. **The Navy cannot fulfil the full ambition of the Integrated Review with its current fleet. It needs more lower-end, adaptable vessels, like the planned Type 31 frigate, to fulfil the presence operations planned. A large part of the Government's plan to address this relies on increasing availability, as well as through the Type 32 programme. We are not convinced that increased availability can produce enough vessels to be relied upon in an emergency. *If the Navy intends to deliver all missions, especially the presence the IR specifies, growth of major surface combatants needs to double, with growth from***

44 Qq177, 228, 269; Q2

45 Dr Basil Germond (Senior Lecturer at Lancaster University) (NAV0004); Oral evidence taken on 23 March 2021, HC (2019–21) 1333, Q80; There may be some opportunities to slightly speed up production—Society of Maritime Industries (NAV0032) told us, "It is likely that the drum beat of delivery of Type 26 could be increased, with a potential reduction in overall programme costs, but that may cause difficulties for the MOD's overall funding profile"—but this unlikely to significantly alter the timeline.

small, adaptable vessels. The resource budget, personnel and the number of auxiliary vessels should grow commensurately. This expansion will require a significant increase in funding.

47. ***The Ministry of Defence should be honest with the public about the deteriorating international security situation, the capabilities the Navy will need to protect Britain in this environment, and the funding required to deliver those capabilities. We believe that if the public understands the Navy's requirements, they will support the increase in funding necessary to deliver it.***

48. **The Indo-Pacific tilt is a significant change in the UK's defence posture which will increase the demand and risk placed on finite resources. We will consider the value and effectiveness of the overall tilt policy and greater engagement in the region in future inquiries. Under current plans the naval assets assigned to the Indo-Pacific are only sufficient for the current very limited presence operations in a stable security environment. It is unlikely that they will be able to complete more challenging missions, and may even find themselves in danger, if the UK is drawn more deeply into the region and forced to commit more forces to defend UK interests, or if the local security situation deteriorates. As a result, the increased commitment to the region must be regarded as one of the many risks the Royal Navy faces in a bumpy decade.** ***The Government must be honest with the public with regards to the cost of the Indo-Pacific tilt. The Department should confirm in its response how regular future carrier strike group deployments will be, and whether they will have the same fleet composition, missions and support from allies as the 2021 carrier strike group deployment.***

3 The Current Fleet

The Navy's Current Capabilities

The Structure of the Navy's fleet

49. The Royal Navy's fleet is described by experts as a "balanced fleet": one with a broad range of assets for different tasks, not a fleet designed around one particular mission. Dr Germond defines it as a fleet that can fulfil the naval functions described by Professor Haines in Chapter 2, as well as diplomatic and defence engagement missions. (See Table 6 in Appendix 1 for the current composition of the fleet). Witnesses have been clear that the decision to build a balanced fleet and to invest in two aircraft carriers has set the size and shape of the fleet for decades to come.[46]

50. A balanced fleet is not the only, or even the most common, option for the design of a navy. For example, China is pursuing a force design focused on specific missions, such as control of its local maritime areas. This specialisation can allow it to more efficiently and effectively block nations, such as the UK, that have spread their naval forces more broadly across balanced fleets from projecting power into these regions.

The Royal Navy's Strengths …

51. Sir Philip Jones told us that the Royal Navy is, along with the US and France, one of the few navies that is "globally deployable and effective at all the tasks they are given". Notwithstanding the important role of allies in CSG21, he confirmed, "Very few nations are capable of deploying a genuinely credible carrier strike group, not just to that region but anywhere."[47] The fact that the Navy was able to deliver CSG21 while simultaneously exercising a second aircraft carrier and deploying the Littoral Response Group (North) task force for the first time is additionally impressive.

52. The Secretary of State told us that the goals of CSG21 included establishing and reinforcing international partnerships and networks and promoting UK industry and exports. He said that the group would take a "confident but non-confrontational" approach. The evidence we took, along with media reporting suggest these goals have been largely met. Mr Pyne and Professor Kotani told us that CSG21 was welcomed by Australia and Japan. The group conducted at least one passing exercise with a naval vessel from almost all of the countries it passed en route. As part of HMS Defender's visit to Odessa, the UK, Ukraine and Babcock signed an agreement for the sale of two refurbished Sandown minehunters and eight small missile warships, and UK involvement in Ukraine's development of a frigate capability. It may also have contributed to the admission of the UK as a dialogue partner to ASEAN, one of the Government's major aims for the region.[48]

46 Dr Basil Germond (Senior Lecturer at Lancaster University) (NAV0004); Professor Geoffrey Till (Dudley Knox Chair of Naval History and Strategy at US Naval War College) (NAV0022); Q12

47 Qq4,13; Dr Basil Germond (Senior Lecturer at Lancaster University) (NAV0004) said it "occupies one of the top spots of the global naval pecking order".

48 Letter dated 24 May 2021 from the Secretary of State for Defence to the Chair regarding the Carrier Strike Group Deployment; HC Deb, 26 April 2021, col 68; Ministry of Defence "UK signs agreement to support enhancement of Ukrainian naval capabilities", 23 June 2021; British Embassy Manila, "UK becomes ASEAN Dialogue Partner", 6 August 2021

53. The loss of an F-35 is an unfortunate blemish on this impressive record. Although an investigation is still ongoing into the cause of the accident, the loss of an aircraft costing the UK £100 million and representing roughly 5% of the aircraft carriers' current fleet must be taken extremely seriously. Reports that the aircraft lost is one of the newest in the group are additionally concerning, as are delays in physically recovering the aircraft.[49]

54. The deployment also demonstrated some of the ways in which adversaries might respond in the grey zone to a more active and present Royal Navy. While HMS Defender and HNLMS Evertsen[50] transited the Black Sea, Russian aircraft and coastguard vessels shadowed them, and the Russian government attempted to spread disinformation that Russian forces had fired warning shots and dropped bombs in HMS Defender's path. These encounters followed an incident on 18 June in which the locations of HMS Defender and HNLMS Evertsen were falsified by unknown actors.[51] The Chinese navy reportedly dispatched submarines to shadow the task group for part of the trip, which Mr Pyne and Professor Kotani told us is "common practice for China whenever a foreign nation sends naval forces into the South China Sea".[52]

55. **The Royal Navy should be proud of its position as one of the leading global navies and its ability to deliver and operate two aircraft carriers. The carrier strike group deployment has shown that, when working with allies, the Navy can deliver a task group able to meet the goals of establishing presence, building relationships with partners and supporting trade. The servicemen and women and civilian staff who worked hard to deliver the deployment should be proud of their achievement. We note that the loss of the F-35 plane, which is still being managed as we write this report, is a significant incident, and we are thankful for the safe recovery of the pilot.**

… and Weaknesses

56. We heard that, despite these strengths, there are nevertheless significant limitations to the Navy's capacity. Professor Caverley, for example, cautioned that:

> In terms of UK-only or NATO missions, based on the balance of platforms in its fleet, the Royal Navy is optimized for power projection missions in highly permissive environments (i.e. Libya [Operation Ellamy, 2011]). It is not optimized for a major fleet engagement in the Pacific. Nor is it optimized for an ASW [anti-submarine warfare] campaign in either Europe or Asia.[53]

57. This inquiry has identified a number of areas where there are existing gaps in capability or potential gaps in the very near future. These are:

- Unclear plans for F-35s and the aircraft carriers;
- Limited lethality;

49 Justin Bronk, RUSI Airpower and Technology Research Fellow, Twitter, 6 December 2021

50 His Netherlands Majesty's Ship Evertsen—a frigate from the Royal Netherlands Navy that was part of the strike group.

51 The automatic identification system was faked to show them close to the Russian naval base in Crimea, when they were moored in the Ukrainian port of Odessa.

52 "HMS Defender: Russian jets and ships shadow British warship" BBC, 23 June 2021; "Russian aircraft harass RNLN frigate Evertsen in Black Sea" Janes, 2 July 2021; "Positions of Two NATO Ships Were Falsified Near Russian Black Sea Naval Base" USNI News, 21 June 2021; Q124

53 Jonathan D. Caverley (Professor at US Naval War College) (NAV0042)

- Improving digital connectivity;
- The future of the Royal Marines;
- Submarine numbers; and
- Limited Resource Budget.

Unclear Plans for F-35s and the aircraft carriers

58. Professor Caverley stressed the importance of defining how the aircraft carriers will be used, as this would determine what other vessels would be required in the fleet. The UK's published military doctrine on maritime power, JDP 0–10, states that the aircraft carriers and the Carrier Enabled Power Projection (CEPP) capability (provided by the aircraft carriers combined with the F-35s, helicopters and related assets) will be used to deliver carrier strike, which it defines as "the ability to use fixed-wing aircraft from a maritime base to project military power from the sea". Admiral Radakin confirmed that this would largely be employed in conjunction with other UK and allied forces: the aircraft carrier's F-35s would be used to defeat enemy air defences and establish control of the air, with the mass of ordnance being delivered by fourth-generation aircraft from the RAF and international partners. The aircraft carriers will also be used to deliver rotary wing strike, littoral manoeuvre ("exploiting the access and freedom provided by the sea as a basis for operational manoeuvre") and to "deliver humanitarian assistance and other Defence Engagement operations".[54]

59. Witnesses have stressed that the carriers have the potential to do more. Professor Caverley told us:

> The theory of the carrier for the United States is changing. It's not just a strike group; a nuclear-powered aircraft carrier like the Ford—as eye-wateringly expensive as it is, it's a giant source of electricity, and electricity is essential. Organic command, communications, intelligence, surveillance, reconnaissance, computing—that concentration of organic capability inside one ship is one of the theories as to why the United States is still investing in carriers, even though the threat to the carrier is growing.[55]

Although the Queen Elizabeth class carriers are not nuclear powered, and therefore have different power generation capabilities, Professor Caverley and Sir Philip Jones both suggested that the Navy should consider using the carriers to deploy new technologies that require power and are difficult to transport by air or land, or as a command-and-control node in theatre. The Navy has also indicated there may be opportunities for the F-35s to fulfil more missions in the future: Admiral Radakin told us that the armaments required for the F-35 to have more offensive capability "are catching up".[56]

60. ***The Department should provide further explanation of what Carrier Enabled Power Projection (CEPP) is intended to deliver. This should include consideration of what innovative capabilities the carriers can provide beyond carrier strike, littoral***

54 Qq12,23–26; Ministry of Defence, Joint Doctrine Publication 0–10, 2017, 4.4, 4.7(a), 4.12; Qq254–258 There are plans to upgrade the F-35s armaments, with the air-to-ground SPEAR Cap 3 missile intended to come in in 2028 (Q252)

55 Q12

56 Qq15,26; Q254

manoeuvre and humanitarian assistance, and more information on what role the F-35 will play in delivering an offensive air capability after any improvements to its armaments. It should be set out in advance of the aircraft carriers' next deployment in a published strategy, with a classified annex if necessary.

61. It is also unclear whether the Navy will procure enough aircraft to effectively deliver the full planned capability. The UK originally indicated that it would purchase 138 F-35s. However, to date the Government has only placed orders for 48 aircraft, of which 21 have been delivered to the UK by Lockheed Martin (including one lost during CSG21), while the remainder are at various stages of production.[57] Ministers from the Department have told us that the MoD has the budget to order more but further purchases would depend on agreements on through-life cost and integration of the Meteor air-to-air missile, with the exact number of planes that the UK will order to be set out in 2025. This will be one year before the full CEPP programme is due to achieve Full Operating Capability and two years after the F-35 element of the programme is expected to have achieved Full Operating Capability.[58]

62. According to Lockheed Martin:

> Once 48 aircraft are delivered, the MoD could routinely deploy 24 F-35B aircraft for CEPP, whilst continuing to provide a training squadron. However, this fleet size leaves little resilience, and would not allow the UK to meet the full capacity of a single carrier (36 jets) without impacting training throughput. …
>
> Lockheed Martin assesses that 70 to 80 F-35B aircraft are required to deliver a credible and resilient CEPP capability, throughout the life of the Queen Elizabeth Class carriers (to 2068). … It would allow 48 F-35B aircraft routinely to be available for CEPP.[59]

We believe the actual number required to be higher, as it must allow for a greater attrition rate than is probably expected.[60] Admiral Radakin told us that the MoD's current plan is to maintain a single air wing that can join with whichever of the two aircraft carriers is held at high readiness at that point in time. He indicated that this air wing would comprise four squadrons, but that the total number of planes required for this was classified.[61] He

57 PQ 36552 on Joint Strike Fighter Aircraft: Procurement, 26 July 2021

58 Oral evidence taken on 23 June 2021, HC (2021–22) 166, Q205 BAE Systems and MBDA have since been contracted to complete the integration of Meteor and Spear missiles onto the F-35 for the UK and Italy ("Italy, UK to complete Meteor, Spear missile integration on F-35 fleets", Flight Global, 17 September 2021); Q316; Ministry of Defence (NAV0030)

59 Lockheed Martin UK (NAV0011)

60 Mr Christopher Cope (Parliamentary Correspondent at Warship World/ Navy Books) (NAV0007); Professor Greg Kennedy (Professor of Strategic Foreign Policy and Director of the Corbett Centre for Maritime Policy Studies at King's College London) (NAV0005); The Ministry of Defence has reported that the procurement profile assumes an attrition rate of 1 aircraft loss every 30,000 hours (roughly 3.5 years) (PQ 818 6 on Joint Strike Fighter Aircraft, 3 December 2021).

61 Q316 The LANCA concept aims to develop an uncrewed aircraft that can provide fighter jets like F-35 and Typhoon with increased protection, survivability and information, with the potential to provide an unmanned combat air fleet in future. Mosquito is a technology demonstrator project that aims to produce a preliminary system design for an unmanned air vehicle and assessment of the key risk areas and cost-capability trade-offs for an operational concept (Ministry of Defence, "Dstl to develop conceptual unmanned aircraft for RAF", 22 July 2019).

noted that the Navy was considering how to provide a second carrier air wing, potentially composed of a hybrid force of jets and drones and modelled on the RAF's Project Mosquito and Lightweight Affordable Novel Combat Aircraft (LANCA) concept.[62]

63. Admiral Radakin's comments leave several questions unanswered. If the Navy chooses to operate four squadrons of 12 planes then an order of 70–80 F-35s would leave only one squadron for the RAF, one training squadron and limited replacement aircraft. The Navy may plan to operate squadrons of fewer than 12 planes (this may be required if the Navy intends to fit four squadrons on one carrier with a maximum capacity of 36 aircraft), with plans to surge to a full capacity on both carriers during conflicts. However, Christopher Cope, Warship World, warned us that plans to surge aircraft onto carriers would be challenging to implement as not all pilots would have sufficient experience of carrier operations.[63]

64. Gabriele Molinelli, a defence journalist, cautioned that the Navy faced significant challenges in deploying drones from its aircraft carriers. He told us that the LANCA programme was not carrier compatible, due to the weight and capability trade-offs required to be able to land on the aircraft carrier decks, and that:

> the need to embark large unmanned aircraft is in turn driving a quest for a catapult and arresting wire solution which will have to be retrofitted to enable the launch and recovery of such large aircraft.[64]

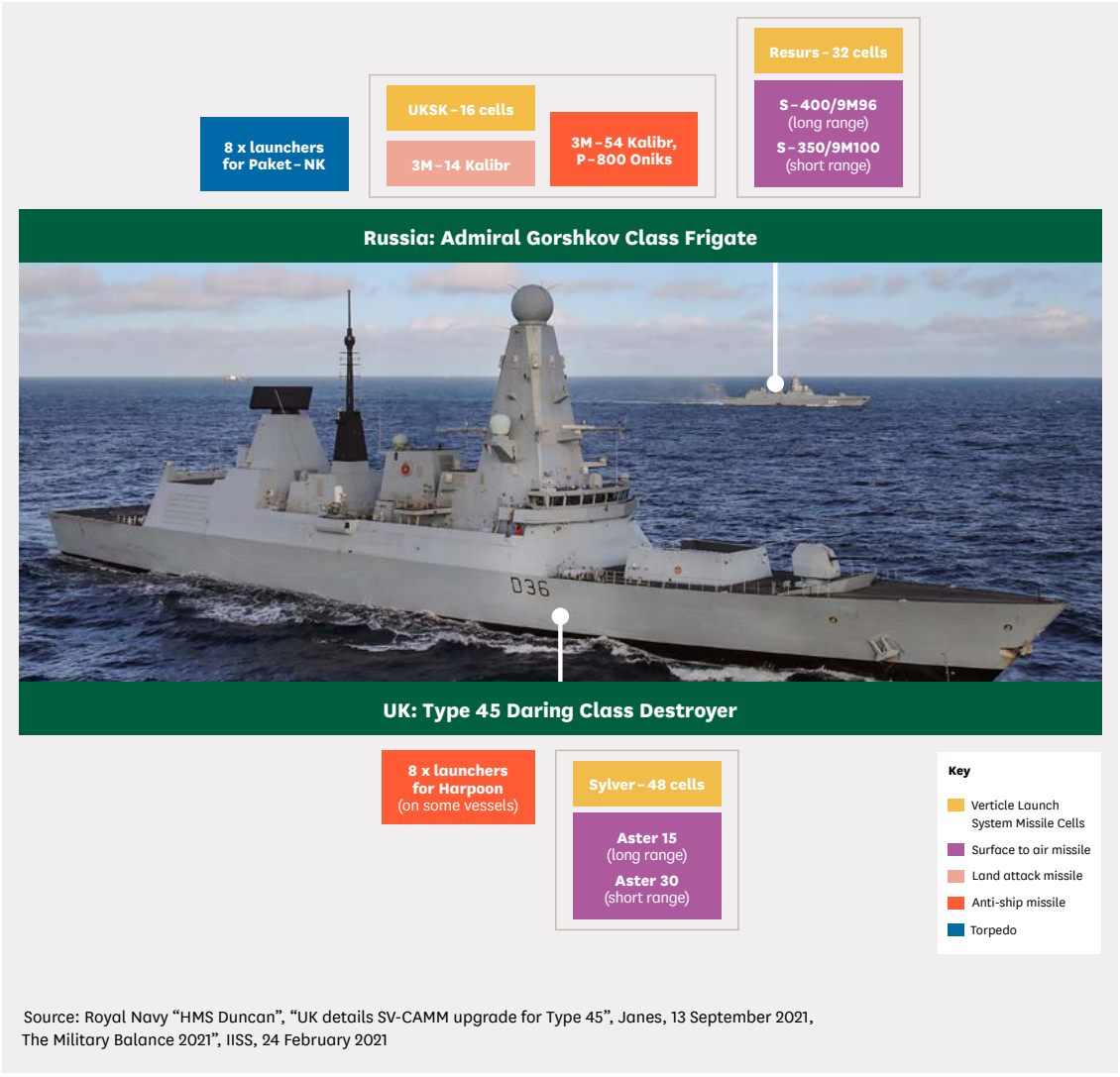
65. **In light of the Department's own target that the UK's CEPP capability will reach Full Operating Capacity in 2026, 2025 is too long to wait to know the size of the planned F-35 fleet and how it could be used.** ***The Department must provide clarity on how it intends to operate the F-35 fleet before then. It must specifically address the questions of how many carriers and F-35s will be operated by the Navy and the RAF as part of routine operations and how a surge capacity will be delivered if one is planned. The Department should also be clear about what role uncrewed aircraft will play and when and how that role can be delivered. Until the Department provides clarity on all these points it is impossible for them or us to be reasonably sure of the risks the programme is carrying and how they can be mitigated.***

Limited Lethality

66. Professor Till was among several witnesses who told us that Royal Navy vessels are often "decidedly under-armed and with worryingly limited magazines" when compared with peers and adversaries. He noted that the Australian variant of the Type 26 frigate will be fitted with a torpedo launch system. The UK's version will instead have to rely on the helicopters on board to deliver torpedoes. Admiral Radakin confirmed to us that much of this criticism "was very fair".[65]

62 Q317
63 Mr Christopher Cope (Parliamentary Correspondent at Warship World/ Navy Books) (NAV0007)
64 Gabriele Molinelli (NAV0002)
65 Professor Geoffrey Till (Dudley Knox Chair of Naval History and Strategy at US Naval War College) (NAV0022); Dr David Blagden (Senior Lecturer in International Security at University of Exeter) (NAV0020); Cllr. Anthony Linden (NAV0024); Q236

UK Type 45 destroyer vs Russian Admiral Gorshkov frigate armaments



Source: Royal Navy "HMS Duncan", "UK details SV-CAMM upgrade for Type 45", Janes, 13 September 2021, The Military Balance 2021", IISS, 24 February 2021

67. A study by defence commentator Commander (retd) Tom Sharpe found that, on a rough comparison of number of weapons systems on ships, the Royal Navy scores significantly below average compared to peers and adversaries (see Table 2 below). The author notes that if the numbers of missiles actually carried by different vessels were compared the Royal Navy would score even worse.[66]

66 Commander (retd) Tom Sharpe, "Under-gunned Royal Navy warships?" Navy Lookout, 22 May 2021

Table 2: Warship Weaponry International Comparison

Country	Class	NGS	CIWS	PDMS	SAM	ABM	SSM	LAM	Torpedo	Helo	No	Av
UK	Type 23 frigate	Y	N	Y	N	N	Y	N	Y	Y	5	5
	Type 45 destroyer	Y	Y	N	Y	N	Y	N	N	Y	5	
USA	Ticonderoga Cruiser	Y	Y	Y	Y	N	Y	Y	Y	Y	8	8
	Arleigh Burke destroyer	Y	Y	Y	Y	Y	Y	Y	Y	Y	9	
	Zumwalt destroyer	Y	N	Y	Y	N	Y	Y	Y	Y	7	
France	FREMM frigate	Y	N	Y	Y	N	Y	Y	Y	Y	7	5.7
	La Fayette frigate	Y	Y	Y	N	N	Y	N	N	Y	5	
	Horizon destroyer	N	N	Y	Y	N	Y	N	Y	Y	5	
Canada	Halifax frigate	N	Y	Y	N	N	Y	N	Y	Y	5	5
Netherlands	De Zeven Provinciën frigate	Y	Y	Y	Y	N	Y	N	Y	Y	7	7
Australia	Hobart destroyer	Y	Y	Y	Y	N	Y	N	Y	Y	7	6.5
	Anzac frigate	Y	Y	Y	N	N	Y	N	Y	Y	6	

Country	Class	NGS	CIWS	PDMS	SAM	ABM	SSM	LAM	Torpedo	Helo	No	Av
China	055 destroyer	Y	Y	Y	Y	N	Y	Y	Y	Y	8	7
	052D destroyer	Y	Y	Y	Y	N	Y	Y	Y	Y	8	
	054 frigate	N	N	N	Y	N	Y	Y	Y	Y	5	
Russia	Slava cruiser	Y	Y	Y	Y	N	Y	N	Y	Y	7	6.25
	Udaloy destroyer	Y	Y	N	Y	N	Y	N	Y	Y	6	
	Gorshkov frigate	Y	Y	N	Y	N	Y	Y	Y	Y	7	
	Buyan corvette	Y	Y	Y	N	N	Y	Y	N	N	5	

Source: Commander (retd) Tom Sharpe, "Under-gunned Royal Navy warships?" Navy Lookout, 22 May 2021

Definitions Used:

NGS—Naval Gunfire Support capable weapon: gun bore > 100mm

CIWS—Close in Weapon System: multi-barrel, rapid-rate-of-fire gun

PDMS—Point Defence Missile System: <30nm range, not suitable for task group protection

SAM—Surface to Air Missile: >30nm range, suitable for air defence

ABM—Anti-Ballistic Missile

SSM—Surface to Surface Missile

LAM—Land attack Missile: e.g. Tomahawk

68. Sir Philip Jones advised that this situation was a result of cost reduction and compromises in outfitting the ships. Officials in the Department believed the Navy was unlikely to use offensive missiles in an engagement and had therefore prioritised capabilities like sonar, torpedoes and medium-range guns:

> Where we have had to make the case more regularly, and increasingly powerfully, is to fill some of the gaps and now, of course, potentially some of the tubes in the Type 26 with more of a strike capability, which we have not had before.[67]

He stressed that vessels did not lack defensive capabilities against an incoming strike and said that the Government had prioritised the availability of surface-to-air missiles and close-range air defence missiles. He also explained that the challenge of vessels being fitted "for but not with" weapons systems was partly to avoid the issue of vessels' and weapons systems' procurement cycles not syncing and to avoid having to regularly replace weapons systems at great cost.

69. As shown on Table 2 above, none of the Royal Navy's surface vessels have a missile that can attack targets on land. This is a startling absence. The only land attack capability in the Royal Navy is the Tomahawk missiles delivered by attack submarines. The Department told us in its written evidence that it would "consider opportunities" to introduce this. Vice Admiral Chris Gardner, Director General, Ships Domain, DE&S, said that the desire to include a land attack missile like the Tomahawk was the reason why the Type 26 frigates will be fitted with Mark 41 launchers, although he noted that the Navy was still deciding whether to fill these with Tomahawks (which are compatible with them) or an alternative missile.[68]

70. When we put these concerns to the Minister for Defence Procurement and the then First Sea Lord in oral evidence, they promised us that this policy is now shifting and that for new vessels the Navy was prioritising lethality and long-range land attack. However, we were disappointed to hear that despite these commitments the Navy was still debating the Type 31 being fitted "for but not with" the Type 41 launcher that would enable it to field surface-to-surface missiles.[69]

71. A key step in delivering this improved lethality will be the replacement of the Harpoon surface-to-surface missile system when it goes out of service in 2023.[70] The Secretary of State had announced a plan to replace Harpoon with an interim surface-to-surface guided weapon.[71] However, Admiral Radakin confirmed that the Navy had paused the decision on this as it evaluates whether to focus instead on developing hypersonic and long-range weapons with international partners, which would not be available until the early 2030s. He noted that the interim Harpoon replacement would cost up to £250 million for five sets on three ships and would only be available in 2026–27.[72]

72. The primary option for developing a hypersonic weapon with international partners is the Future Cruise/Anti-Ship Weapon (FC/ASW) programme with France. An inquiry

67 Qq17–18
68 Ministry of Defence (NAV0030); Qq262–263
69 Qq259–265; Q174
70 Lockheed Martin UK (NAV0011); Dr Sidharth Kaushal (NAV0037)
71 HC Deb, 22 March 2021, col 638 [Commons Chamber]
72 Qq259–266

into this programme by our predecessor, undertaken jointly with its French counterpart in the Assemblée nationale identified several priorities for the UK in this programme. This included ensuring that it "is interoperable with a broad range of platforms deployed by the UK and France's allies". For the Navy it is particularly important to know whether it will be compatible with the US Mark 41 vertical launch system (VLS - the structure on the ship for holding and firing missiles) as well as the French Sylver VLS, as both of these are or will be used by UK vessels and missiles in the UK arsenal. The Department's response to that inquiry stated that the UK's plan for the FC/ASW included a requirement that it be compatible with the Mark 41 vertical launch system and Lockheed Martin has indicated that this might be technically possible. The inquiry also concluded "any decision to procure a 'bridging' system with long post-2030 life expectancy would not be viewed favourably in Paris and could pose a serious threat to the strong bilateral relationship that has developed since 2010." This point is only strengthened by the French reaction to the AUKUS agreement.[73]

73. **It is clear that the budget priorities of successive governments have delivered a fleet of porcupines (well defended herbivores). We welcome the promises from the Department that future vessels will carry the offensive missiles they need and in particular that this will restore a land attack capability to the fleet. *The Department must deliver the funding to swiftly end the spectacle of space on highly capable vessels being used to carry nothing but air. This should include consideration of both the threats and the opportunities posed by hypersonic missiles as well as the potential to use common missile silos across classes and to deliver compatibility with different international partners. The Department should confirm in its response that it still intends the FC/ASW to be compatible with the Mark 41 vertical launch system. The Department should also be mindful of previous warnings that procuring a 'bridging' system with long post-2030 life expectancy could damage the relationship with France.***

Improving Digital Connectivity

74. Improving the integration, communication and data sharing between all the Navy's assets—as described in Chapter 2—will require a secure "digital backbone"[74]—a common architecture that facilitates the sharing of raw sensor data across all sensors and effectors, enabling any asset to engage any threat.[75] As techUK and the Department have both stated, much of the technology needed for this is commercially available, although ensuring that Defence has the appropriate skills and processes necessary to exploit the technology will be the principal challenge.[76]

75. Both the Department and the Navy have plans to introduce digital backbone programmes like this. The Department has set out plans to deliver a capability for the whole of Defence by 2025. Its goal is to transform operational capability by "connecting any sensor to any effector via any decision-maker" across all the armed forces and "connecting sensors in one domain to platforms in other domains, via decision-makers at

73 Defence Committee, Sixteenth Special Report of Session 2017–19, Future Anti-Ship Missile Systems: Joint inquiry with the Assemblée nationale's Standing Committee on National Defence and the Armed Forces: Government Response to the Committee's Thirteenth Report, HC 2003, paras 6, 13–14, Lockheed Martin "Mark 41 Vertical Launching System"

74 techUK (NAV0012); Human Security Centre (NAV0025)

75 Lockheed Martin UK (NAV0011); Defence Synergia (NAV0006)

76 techUK (NAV0012); Ministry of Defence, Digital Strategy for Defence, 21 April 2021, p2; pp3,12,14; Oral evidence taken on 9 November 2021, HC (2021–22) 842, Q61

the relevant levels in real time".[77] The Navy is aiming to deliver a programme called the "Naval Strike Network" (NSN). This is intended to deliver an information architecture that will structure how information is shared between assets in the fleet. It aims to connect a mix of crewed and uncrewed assets (including "a fully autonomous major warship in the next decade"), which will include both sensors and effectors, within a single integrated network. It will have a "plug-and-play", fully open architecture, meaning that new assets should be able to connect directly to it without additional work.[78]

76. While the Society of Maritime Industries has been complimentary of the progress so far, the status of the NSN programme is unclear. The Navy announced at the 2021 Defence and Security Equipment International trade exhibition that the project is still in the initial stages with some major technical elements (the bearer architecture and communications infrastructure) yet to be determined. However, the Navy has revealed information about some technical elements and use of the NSN in trials with the Royal Marines.[79]

77. It is also unclear how the two programmes relate to one another. The then Chief of the Defence Staff, General Sir Nick Carter, stressed to us that the digital backbone and the NSN, along with similar programmes being developed by the other services, would need to have open data standards to allow them to share data and an open systems architecture so they could evolve together.[80]

78. Sir Nick Carter noted that one of the challenges to delivering the digital backbone was that data across defence remained stove piped and the significant work was required to address this. This was corroborated by Airbus.[81] Industry experts working on integration across military domains have advised us in private that the best way to deliver integration is building connections and addressing stovepipes piece by piece. Witnesses have pointed to a number of specific integration and connectivity challenges across the fleet that could be addressed as part of this:

- Limited bandwidth for communications on board ships;[82]
- The lack of a data link between Wildcat helicopters and warships, with flight commanders required to physically take a laptop to the bridge to transfer data (the Link 16 Joint Tactical Information Distribution System currently fitted to the Navy's Merlin helicopters was suggested as a solution.);[83]
- The need to develop interoperability between the fleet's radars, allies and strategic radars, such as the UK's planned Ballistic Missile Defence Ground Radar; and[84]

77 Ministry of Defence, Digital Strategy for Defence, 21 April 2021, pp3,12,14

78 "RN seeds plans for Naval Strike Network as digital backbone", Janes, 21 September 2021; Vice Admiral Nick Hines, "Integration, interchangeability and innovation: a new balance of advantage?", 20 May 2021

79 Society of Maritime Industries (NAV0032); "Autonomous Technology Drives Royal Navy Transformation", Admiral Sir Tony Radakin, The Disruptor (Deputy Assistant Secretary of the Navy Quarterly News Letter), Winter 2021

80 Oral evidence taken on 9 November 2021, HC (2021–22) 842, Q61; Sam McBriar, Director of Strategic Marketing for Maritime, Thales UK, added that ensuring an open systems architecture would also be necessary to ensure that the modular pods the Navy is beginning to bring on board (as discussed in Chapter 4) are able to integrate with command and control systems (Q62).

81 Oral evidence taken on 9 November 2021, HC (2021–22) 842, Q57; Airbus (NAV0017)

82 Defence Synergia (NAV0006)

83 Mr Christopher Cope (Parliamentary Correspondent at Warship World/ Navy Books) (NAV0007)

84 Lockheed Martin UK (NAV0011)

- The need to ensure onboard systems are compatible with onshore systems. The Ministry of Defence has advised that current legacy computer systems will be replaced beginning in late 2021 to deliver compatibility.[85]

79. **The delivery of digital and data integration like the Naval Strike Network will be absolutely crucial if the fleet is to be operated effectively. *The Department must ensure that the Naval Strike Network is fully funded and compatible with Defence's digital backbone.***

The future of the Royal Marines

80. In its 2018 report on the future of the Royal Marines and the UK's amphibious capability, our predecessor Committee called for the UK's "unique experience and expertise in amphibious operations" to be sustained in light of both their continuing relevance to modern warfare and the "uncertain and diversifying picture of threats". It warned that disposing of our amphibious capability would "put the interests of this country at serious risk", and be "a drastic waste" of tailor-made vessels and military specialism. In its response the Department told our predecessor that it "remains committed to ensuring the future of the amphibious warfare capability within our future force structures."[86]

81. Witnesses to our inquiry confirmed the continuing importance of the UK's amphibious capabilities in the current and likely future security environment. Professor Till told us that the traditional amphibious focus of the Royal Marines has "rarely been as critical to wider fleet success than it is now". The Royal Marines themselves recently demonstrated their impressive capabilities in conjunction with allies on Exercise Green Dagger 21. 40 Commando reportedly showed the effectiveness of new technologies and concepts they employed while working as part of a multi-national force alongside the US's 7th Marine Regiment in a five-day multi domain war-fighting exercise against an attacking force of the US's 3rd Marine Regiment. We also heard that the Marines will themselves face an increasingly challenging operating environment as developments in coastal defence systems make traditional amphibious operations more difficult.[87]

82. The Navy is now in the process of developing the Future Commando Force operating model, with the goal that "more Royal Marines will operate from the sea, utilising new and innovative technology as high-readiness troops, forward deployed and ready to react, whether that's war-fighting, specific combat missions such as commando raids, or providing humanitarian assistance."[88]

83. As part of this effort, the Navy is standing up two Littoral Response Groups (LRGs). The first of these, Littoral Response Group (North), has been deployed to the North Atlantic and comprises: a force of embarked Marines from 45 and 30 Commando; amphibious

85 PQ 51892 on Warships: Software, on 23 September 2021

86 Defence Committee, Third Report of Session 2017–19, Sunset for the Royal Marines? The Royal Marines and UK amphibious capability, HC 622 para 98, paras 66–69; Defence Committee, Sixth Special Report of Session 2017–19, Sunset for the Royal Marines? The Royal Marines and UK amphibious capability: Government Response to the Committee's Third Report, HC 1044, 16 May 2018 para 5

87 Professor Geoffrey Till (Dudley Knox Chair of Naval History and Strategy at US Naval War College) (NAV0022); Lockheed Martin UK (NAV0011) also suggested important roles marines could play in naval warfare; "No 'surrender' - what really happened between US and British Marines at a training exercise", Task & Purpose, 15 November 2021; Human Security Centre (NAV0025); Dr Sidharth Kaushal (NAV0037) also advised us to review the Future Commando Force as a key part of the Navy's capability in the Indo-Pacific.

88 Royal Navy, "New Commando uniform for Royal Marines (mod.uk)", 27 June 2020

assault ship HMS Albion; landing dock RFA Mounts Bay; Type 23 frigate HMS Lancaster; and Wildcat helicopters from 847 Naval Air Squadron. The second, Littoral Response Group (South), will have a similar structure and will be based in Duqm, Oman, from 2023. According to the International Institute for Strategic Studies these LRGs are intended to allow the Royal Marines to operate as smaller teams in a dispersed and agile way with a greater emphasis on technology. They will also prioritise maintaining a forward presence and working on capacity building and engagement with local forces.[89]

84. Some witnesses expressed a range of concerns about the transformation including that the funding to deliver it, in the words of Rear Admiral Burton, "is not happening at the pace that we would want." Mr Molinelli warned that the LRGs would not have the amphibious assets required. He predicted the Navy would not be able to provide each LRG with the Albion and Bay class ships they require as one Albion is mothballed and the Bay class vessels were in demand for other roles. He also cited the lack of helicopter maintenance facilities on the Navy's amphibious ships since the retirement of HMS Ocean. He and other commentators have speculated that this gap may be addressed by the £50-million conversion of a Bay class to deliver "a more agile and lethal littoral strike capability" or the six Multi-Role Support Ships promised in the DCP, however details and timelines on both of these are unclear. The Ministry of Defence has also indicated that there are likely to be cuts to the strength of the Royal Marines, possibly from 6,500 to 6,100. Our predecessor Committee warned that plans to use the Queen Elizabeth class carriers as amphibious platforms would be limited by the fact that they could only deliver airborne amphibious capability and would be at risk in their proximity to the shore.[90]

85. As a result of these and existing capability gaps, Mr Molinelli judges that the Royal Marines will no longer be a "true amphibious capability", instead becoming "a potent pre-landing force" that will need to rely in part on the Army. Notably, the Navy Lookout website further concludes that, "The Littoral Response Groups make sense in an age of continual sub-threshold war and grey zone activity but should the RN ever be called on to mount opposed amphibious operations against a peer adversary, assets are thin."[91]

86. **Evidence continues to show that sacrificing the Royal Navy's amphibious capability would be, in the words of our predecessor Committee, "a short-sighted, militarily illiterate manoeuvre totally at odds with strategic reality." Against this background we are concerned that the Future Commando Force and the Littoral Response Groups are not properly resourced to continue amphibious operations.** ***The Department must confirm that it remains committed to retaining the Royal Marines' amphibious capabilities.***

89 "UK Littoral Response Group: the shape of things to come?", IISS, 25 June 2021; Royal Navy, "HMS Albion leads the way as commandos head for the Baltic (mod.uk)", 7 May 2021;

90 Oral evidence taken on 13 April 2021, HC (2019–21) 1333, Q99; Gabriele Molinelli (NAV0002); "UK Littoral Response Group: the shape of things to come?", IISS, 25 June 2021; PQ HL14958 on Marines, 22 April 2021; Defence Committee, Third Report of Session 2017–19, Sunset for the Royal Marines? The Royal Marines and UK amphibious capability, HC 622 para 98, paras 66–69

91 Gabriele Molinelli (NAV0002); "Understanding the Royal Navy's littoral response group Concept", Navy Lookout, 17 August 2021

Submarine Numbers

87. Witnesses consistently agreed with Admiral Tony Radakin's view that the underwater domain will become even more important as stealth becomes less achievable in other domains.[92]

88. As a result, many witnesses argued that navies are likely to require more submarines and underwater assets. Professor Caverley told us that:

> speaking from the American experience there is a lot of debate about what the fleet should look like. The one thing that is not up for debate is that we need as many attack submarines as possible. Submarines are capable of doing two things. They are very good at anti-submarine warfare. … Submarines are also useful for getting inside [areas that are within range of enemy weapons].[93]

89. However, according to Professor Caverley and Dr Kaushal, the Royal Navy fleet has a relatively small number of attack submarines in comparison to the "submarine-intensive" warfare practiced in Asia and by Russia and may lack the submarines and surface ships required for an ASW [anti-submarine warfare] campaign. Professor Kotani described submarines as a significant element of the maritime security architecture of the Indo-Pacific, noting that China operates 60.[94]

90. Several witnesses called for the UK to increase its investment in submarine capabilities. Professor Till and the Defence Synergia campaign group argued for the UK to acquire additional attack submarines, although they noted that the existing commitments to Astute and Dreadnought meant there was unlikely to be time or budget to acquire them in the short term.[95] The Society of Maritime Industries advised that as well as continuing to need manned submarines the Royal Navy also requires a growing number of underwater autonomous systems to counter the submarine threat.[96]

91. When we put these issues to Admiral Radakin, he told us that the Navy was investing in additional ASW capabilities, including P-8 patrol aircraft, Merlin Mk 2s, and underwater sensors, as well as research programmes and collaboration with the US and other international partners. He sought to provide reassurance that the Royal Navy had regained ASW skills that had been lost 10–15 years ago.[97]

92. **The underwater domain will become an ever more important part of naval warfare in the future.** ***The Department should explore increasing the size of the attack submarine fleet as part of the Astute successor programme, Submersible Ship Nuclear Replacement (SSNR). At the very least it must confirm in its response that it will not decrease the number of attack submarines in the fleet below the seven Astute class submarines it plans to operate. The Department must also consider whether the SSNR***

92 Q241 This repeated similar comments he made in "First Sea Lord's Message on the Integrated Review", 23 March 2021.

93 Q8

94 Jonathan D. Caverley (Professor at US Naval War College) (NAV0042); Dr Sidharth Kaushal (NAV0037); Q109

95 The possibility that the UK will produce attack submarines for Australia under the AUKUS deal raises further questions about production capacity at Barrow.

96 Professor Geoffrey Till (Dudley Knox Chair of Naval History and Strategy at US Naval War College) (NAV0022); Defence Synergia (NAV0006); "AUKUS: Plotting Australia's new submarine course" IISS, 28 September 2021; Society of Maritime Industries (NAV0032)

97 Qq173,241

submarine design will include a horizontal launch missile system in line with current UK submarines, or a vertical launch system for systems such as Tomahawk, in line with some of the more modern US Navy submarines. The Department should confirm in its response how it will ensure that current UK attack submarines retain their land attack missile capability, given the US Navy's transition to vertical launch systems.

Limited Resource Budget

93. Under the 2021 Spending Review the Ministry of Defence's Resource Departmental Expenditure Limits (RDEL) remains relatively flat until 2025 and declines in real terms relative to both the current year and 2019–20. Although there is still a slight increase in spending in absolute terms, the effect of this increase has been absorbed by uplifts in inflation forecasts. This may have implications for funding available for the Navy and the other armed services' day-to-day resources and administration costs, including operations and other activity, support (maintenance, stores and spares), and pay.[98]

Table 3: Annual Ministry of Defence RDEL in Budget 2021

							Average annual real terms growth	
Year	Outturn 2019–20	Outturn 2020–21	Baseline 2021–22	Plans 2022–23	Plans 2023–24	Plans 2024–25	2021–22 to 2024–25	2019–20 to 2024–25
£ billion (current prices)	29.5	30.6	31.5	32.4	32.2	32.4	-1.4%	-0.6%

Source: HM Treasury, "Budget 2021: Protecting the jobs and livelihoods of the British People", 27 October 2021

94. The Navy will be dealing with reduced RDEL at a time when two new Aircraft Carriers have been added to the fleet. The Ministry of Defence has reported that the estimated annual running cost of one Queen Elizabeth Class Aircraft Carrier is £96 million, compared to an average annual running cost of £11 million for a Type 23 Frigate and £13.5 million for a Type 45 destroyer.[99] This large additional cost will need to be accommodated in the flat RDEL. The Navy is unlikely to be able to reduce its payroll budget as it will begin transitioning and replacing a large number of vessels from 2028 and Admiral Radakin has indicated that a large workforce will be needed to crew both the ships entering and leaving service during the transition (outlined in Chapter 4).

95. Admiral Radakin attempted to reassure us that "We have a track record of doing better than some of the concerns" but noted "We will have to wait and see whether what we are putting into place beats the inflation pressures." He acknowledged that to meet the planned RDEL budget would require the Navy to change the way it operates. The 2020 National Audit Office (NAO) report on the carriers noted that the anticipated shortfall in their running costs after 2021 may create additional financial pressures across the Navy's

98 Qq197–198
99 DEP2021–0523; PQ 1310 2 on Frigates, 14 March 2018

portfolio or affect how the carriers are used. It added that for the Navy to achieve its aspirations for Carrier Strike, it will need to adapt its fleet-wide support arrangements. The report said the MoD plans to update its cost model for the carriers after CSG21.[100]

96. **We are very concerned that the limited resource budget allocated under the Spending Review for the remainder of this Parliament will be insufficient to properly operate and maintain the full fleet. We were not convinced by the Department's assertion that "the resource budget is adequate to ensure that we maintain the crewing and effectiveness of those additional resources". If this is not remedied, there will almost certainly have to be a compensating reduction in maintenance of or operations by the aircraft carriers or other vessels. If the Navy attempts to cut the payroll costs element of RDEL by reducing personnel numbers, this could make it even harder to bring in the new classes of vessels in the 2030s as planned.** ***Defence spending must increase to allow the Navy's resource budget to beat inflation and to accommodate any new cost model for the aircraft carriers.***

Working with Allies

97. Any assessment of the Royal Navy's capabilities must include the impact of working with allies. Sir Philip Jones advised us:

> For almost all the tasks that we are going to be invited to do, we are going to be invited to do them with allies and partners. Therefore, you don't just look at the size and shape of the Royal Navy; you look at the size and shape of the likely strike groups and integrated taskforces with which we will be working with all of our allies and partners.[101]

98. Admiral Radakin emphasised that these alliances are a source of strength for the Navy. He told us that

> we have a whole host of programmes with different nations. Some of them are strong, such as that with America, and they are getting stronger as you have seen with the likes of the AUKUS deal. We also have arrangements with India, Japan and Australia. It is a sophisticated way of doing business and a highly effective one. There will be times it sends a message to some of our potential foes who don't have that ability to marry with such strong allies. We will be using this even more strongly in the future.

He said that "levels of interoperability with the larger navies within NATO are strong and, I would argue, very sophisticated". (Aside from the US, the larger NATO navies would include, for example, France.) He also noted that the US and UK were now moving beyond interoperability (under which different national forces can operate together) to interchangeability (under which UK and US ships, aircraft and submarines can fight as a "blended force").[102]

99. However, a significant amount of work is required on the political and diplomatic level to ensure that alliances will be effective when it comes to military operations. Laying the groundwork for effective alliances (as well as securing logistical support in the Indo-

100 Qq196–200; National Audit Office "Carrier Strike - Preparing for Deployment", 24 June 2020, 3.19–20
101 Q14
102 Q274

Pacific as noted in Chapter 2) may become an important task for the larger defence diplomacy network promised in the DCP, which promised to "increase our global network by a third, expanding our Defence Attaché network and our British Defence Staffs to co-ordinate activity across regions."[103]

100. As part of laying this groundwork we have heard that it is crucial that allies agree the political objective of each individual operation.[104] Rear Admiral Nicholas Vaujour, Head of French Navy foreign relations, repeated several times to us that the UK and French navies are "able to turn and to provide the same military effect if we agree on the political objective."[105]

101. Sir Philip observed that:

> 'coalitions of the willing' have tended to be more militarily meaningful, and less mired in caveat, because they have all signed up to the goals of the operation to begin with as being consistent with their various national interests.[106]

102. In addition, witnesses have told us that the Navy must put in place the necessary processes and agreements in advance to determine how they will collaborate in the event of a conflict. Professor Kennedy cautioned that the Navy could not simply assume that the US, for example, would provide additional resources under such circumstances. Sir Philip Jones argued that maritime commanders of international task groups, like CSG21, may need to establish a matrix laying out the assets available for engagement in different types of conflict (e.g. a counter terrorism operation vs a hostile state threat), a model which he reports has been highly effective in the Combined Maritime Forces in Bahrain. Sir Philip stressed that, "The key here is to know that you have the necessary sovereign capability under command at all times to achieve your mission, should political/diplomatic considerations temporarily peel off some of your allies."[107]

103. Professor Caverley took the view that exercising with allies would be the best possible way to improve interoperability and would also contribute to deterrence:

> The one thing we can be sure of is that exercises between allies is a fundamental contributor to the deterrence. The naval diplomacy and the militaries that exercise together build trust. They operate better when conditions become more stringent, and they also send a very large message to observers. If I had one dollar or a pound to invest in interoperability, I would be spending it on working with the assets we have here and now, not only because it improves our capability by operating together, but it also sends that deterrent message.[108]

103 Ministry of Defence, "Defence in a Competitive Age", March 2021, 4.5

104 James London (NAV0021); Oral evidence taken on 25 May 2021, HC (2021–22) 166, Q9

105 Oral evidence taken on 25 May 2021, HC (2021–22) 166, Qq9,16

106 Admiral Sir Philip Jones, First Sea Lord (2016–2019) (NAV0043)

107 Professor Greg Kennedy (Professor of Strategic Foreign Policy and Director of the Corbett Centre for Maritime Policy Studies at King's College London) (NAV0005), supported by Mr Christopher Cope (Parliamentary Correspondent at Warship World/ Navy Books) (NAV0007)—"Accordingly, we will need to reply upon our NATO partners. I wonder to what extent the US, Dutch and French governments have made a commitment in this regard."; Admiral Sir Philip Jones, First Sea Lord (2016–2019) (NAV0043).

108 Q25

104. Reliance on allies will also require the UK to seriously consider the trade-offs involved. As Dr Patalano puts it, "The ultimate implication of greater cooperation is, however, a need to balance the strategic advantage of enhancement of national military power against the political limitations of greater dependency on allies' capabilities." Sir Philip warned that although deeply embedding with a smaller number of formal allies strengthens operations through well tested procedures and connectivity, NATO operations have often been limited by national caveats "because the suite of allied nations involved is a constant". Professor Trevor Taylor, Director, Defence, Industries & Society Programme, RUSI, advises that the Government must decide "whether the Royal Navy institutionally is more keen on being able to work closely with the US Navy than it is on operational independence or working with other European navies". Professor Kennedy strongly argues for the UK to prioritise its relationship with the US, although the model of formalising relations he advocates could apply to other alliances as well.[109]

105. **The Navy plans to rely on allies to provide capabilities in almost all military operations and for most major missions working with allies will not be optional. Overall, this way of working is a source of strength for the Navy. However, we do need an honest assessment of the way in which we will integrate in the systems of allies.** ***The Department must do more at the political level to ensure the Navy can rely on this support when needed, including arranging regular exercises with other navies, and engaging the expanded defence liaison network promised by the DCP. The Department must be clear how far it intends to privilege interchangeability with the US over interoperability with other partners and what the trade-offs involved are. It must also be honest about the realistic limits on its ability to act alone.***

Making Friends in the Indo-Pacific

106. Witnesses told us that building relationships with partners will be particularly important in the Indo-Pacific. They identified India, Japan, the Republic of Korea and Australia as key partners. Witnesses also suggested engaging through existing security partnership agreements: the UK could consider deeper engagement with the Five Power Defence Arrangements (FPDA) between the UK, Australia, Malaysia, New Zealand and Singapore, or attempt to join the US-Japan-India-Australia Quad, especially in light of the renewed emphasis on the grouping under the Biden administration. The region also has a number of trilateral agreements the UK could engage with, including US-Japan-South Korea, France-India-Australia, and Indonesia-India-Australia. Mr Pyne argued that this should not been seen as a single choice: "These pieces of architecture are not mutually exclusive, and they all have an important role to play".[110]

107. The AUKUS agreement between the UK, US and Australia marks a significant development in the UK's engagement in the region. Mr Pyne told us:

> AUKUS is important from a number of other perspectives, though, before we turn to nuclear-powered submarines. One is the really important message that it sends in the Indo-Pacific. … [I]t is really the newest piece of

109 Admiral Sir Philip Jones, First Sea Lord (2016–2019) (NAV0043); Dr Alessio Patalano (NAV0036); Professor Trevor Taylor (Director, Defence, Industries & Society Programme at RUSI) (NAV0013); Professor Greg Kennedy (Professor of Strategic Foreign Policy and Director of the Corbett Centre for Maritime Policy Studies at King's College London) (NAV0005)

110 Society of Maritime Industries (NAV0032); Dr Alessio Patalano (NAV0036); Q4; Mr Robert Clark (Research Fellow, Global Britain Programme at Henry Jackson Society) (NAV0038); Qq108–110,139–142

> architecture in what has been quite a tense part of the world. … [I]t really formalises the idea of the UK being interested in the Indo-Pacific beyond mere rhetoric.[111]

Mr Pyne went on to note that AUKUS provides a structure for the UK's role in the region. His assessment that AUKUS shows a commitment by the UK to the region appears to be shared by US officials, who were quoted in the UK press calling the UK's role a "down payment on the Indo-Pacific tilt". He also said it would deliver a "step change" in Australia's capabilities.[112]

108. The UK is not the only European power increasing its involvement in the Indo-Pacific. Mr Pyne stressed that France has 7 million citizens and 2,000 troops in the Indo-Pacific and was becoming even more closely associated with the region. Professor Kotani suggested the two OPVs the UK was sending to the region could "definitely" fit into the Japanese-French exercises and training. Based on policy documents from the French government, France's goals in the region look similar to the UK's, including "a stable, multipolar order based on the rule of law" and a greater role in the ASEAN Defence Ministers' Meeting-Plus (ADMM+) framework and other regional groupings. The country has a trilateral dialogue with India and Australia and conducts regular naval deployments of Floreal-class frigates, d'Entrecasteaux-class patrol ships, an amphibious group and recently a carrier strike group. Professor Kotani told us that in regard to AUKUS,

> it was a little bit unfortunate that the three countries did not deal with the French in a different way. The French are now very angry and some people say this is going to be a severe issue between the US and France, and Australia and France. That will encourage China more.[113]

109. In addition to France, Germany sent the Brandenburg-class frigate Bayern to the Indo-Pacific on a six month mission in August 2021, and Italy launched a trilateral process with India and Japan in June 2021, also focused on promoting stability and a rules based order in the region.[114]

110. The IR and DCP did not explain how the UK and the Navy will work with European partners in the Indo-Pacific. The IR says that as part of the Indo-Pacific tilt "We will also look for ways to work more closely with European partners, including France and Germany" but it also frames them as competitors: "Our goal: we will be the European

111 Q108

112 "US, UK and Australia forge military alliance to counter China", The Guardian, 15 September 2021; Q108 Nuclear power will allow Australian attack submarines to remain at sea for as long as five months and will not need to recharge batteries to maintain speed. Compared to the country's existing Collins class diesel powered vessels, they would also operate more quietly and without emitting detectable exhaust gases to better evade enemy detection and travel approximately 8 knots faster.("US, UK and Australia forge military alliance to counter China", The Guardian, 15 September 2021; "Submarine Pact with Australia against China", The Times, 15 September 2021) More broadly the UK Government has said the AUKUS agreement is intended to foster deeper integration of security and defence-related science, technology, industrial bases and supply chains. The first project will provide nuclear-powered submarines for the Royal Australian Navy and future ones will consider cyber capabilities, artificial intelligence, quantum technologies, and additional undersea capabilities. (Cabinet Office, "UK, US and Australia launch new defence partnership", 15 September 2021; "Biden announces joint deal with U.K. and Australia to counter China", Politico, 15 September 2021)

113 French Ministry for Europe and Foreign Affairs "The Indo-Pacific region: a priority for France", July 2021; "Posturing and presence: the United Kingdom and France in the Indo-Pacific", International Institute of Strategic Studies, 11 June 2021; Q134; Q109

114 "German warship 'Bayern' heads to the Indo-Pacific" Defense News, 2 August 2021; "Shaping a trilateral as Rome looks to the Indo-Pacific", Observer Research Foundation, 12 July 2021

partner with the broadest and most integrated presence in the Indo-Pacific". In addition, although the region and anti-piracy are both priorities for the Navy, the Government has not confirmed whether the UK will continue to remain engaged with the EU-led Op ATALANTA, a coalition of European and non-European nations providing counter-piracy operations in the Western Indian Ocean. Withdrawing from this operation would be in line with what Chatham House has said is a general strategy in the IR of engaging with European nations bilaterally rather than through the EU, however it would be counter to the Government's aim of greater engagement and greater coordination with European partners in the region.[115]

111. **Building interoperability with nations in the Indo-Pacific will be vital for delivering any tilt to the region. This must include coordinating with European partners and working to rebuild the military relationship with France.** ***The Navy must continue to regularly exercise with partners in the region after the conclusion of CSG21, which will help to deter adversaries and demonstrate that the UK's commitment to the region goes beyond rhetoric. This should include regular exercises with European and NATO partners, including consideration of developing a programme of exercises under AUKUS. The Department should develop a strategy for how it will collaborate with both regional partners and NATO allies in the Pacific within the next year. The Department should confirm in its response whether the Royal Navy will continue to contribute to Op ATALANTA.***

Maintaining a Sovereign Core

112. The Minister for Defence Procurement and Admiral Radakin agreed that the Navy would normally fight with allies, but emphasised the caveat that because it was impossible to predict the threat in detail, there were still some circumstances in which the Royal Navy would have to plan to operate alone.[116] Other witnesses noted that this might include situations in which the UK was fighting alongside allies who were unable to provide any additional capabilities or remedy any gaps in the UK fleet because their own forces were fully engaged or significantly degraded, for example in the event of a great power conflict with China.[117]

113. The Department's written evidence stated that "any UK task group will always have a sovereign core to ensure its freedom of action", allowing the UK to operate alone if necessary. In oral evidence Admiral Radakin confirmed that this sovereign core would be designed "so that we can always defend the aircraft carrier with UK ships and submarines" and would be composed of:[118]

- An aircraft carrier;
- An air wing;
- Two destroyers;

115 HM Government "Global Britain in a Competitive Age", March 2021, p66; Royal Navy, "Operation Atalanta", accessed 22 November 2021; "Global Britain lays out its stall, but EU missing in action" Dr Robin Niblett, Chatham House, 23 March 2021

116 Q272

117 Dr David Blagden (Senior Lecturer in International Security at University of Exeter) (NAV0020); Human Security Centre (NAV0025)

118 Q276

- Two ASW frigates;
- An attack submarine; and
- Support shipping.

114. Some evidence raised concerns that the Navy is not able to deliver many of these elements, including F-35 aircraft, destroyers and attack submarines (which are raised elsewhere in this chapter), and Fleet Solid Support ships (FSS) (which are discussed in Chapter 4). We were not reassured by the Minister for Defence Procurement's suggestion that the absence of a Fleet Solid Support ship could be addressed by a carrier strike group carrying some of the stores required in the vessels' hulls.[119]

115. Witnesses also raised concerns that a UK 'sovereign core' would not have the ability to defend itself against the growing threat of ballistic missiles. While Dr Kaushal advised us that it was likely to be five years before the specific threat of the Chinese DF-21D "carrier killer" ballistic missile materialises, media reports in November suggested that China has now added carrier-shaped missile targets to a target range.[120] Yet the UK's Type 45 destroyers currently have the ability only to track, and not defend against, ballistic missiles; this BMD capability was provided to CSG21 through the US Arleigh Burke destroyer. As such, Mr Molinelli told us that adding BMD capability to the Type 45s will soon be "non-discretionary".

116. **We support the Navy's plans to retain a sovereign core capability but are concerned that it cannot currently deliver all the elements required to defend and support the task group.** ***As a result, the Department must take early action on the availability of attack submarines and destroyers, and the lack of Fleet Solid Support shipping. If action is not taken to address this within the next year, we will begin to request updates on progress twice a year. The Department should explore whether there is an option of upgrading the Type 45 destroyer to deliver ballistic missile defence and what the costs and timelines involved are and provide us with updates on the exploratory work.***

Availability of Vessels

117. The availability of the fleet is a crucial element of its effectiveness. In his opening statement to us, Sir Philip Jones stressed that "It is not just the size of the fleets; it is how many are deployable."[121] The Secretary of State has said that his priority for the First Sea Lord remains 'availability' of ships and submarines. The Secretary of State told us:

> 82% of the Surface flotilla is now available, reflecting an arrest of declining numbers, and availability is projected to keep increasing over the next 6–12 months.[122]

119 Q183
120 Society of Maritime Industries (NAV0032); Lockheed Martin UK (NAV0011); Human Security Centre (NAV0025); Gabriele Molinelli (NAV0002) (quoted); Oral evidence taken on 13 April 2021, HC (2019–21) 1333, Qq106–110; "China Builds Missile Targets Shaped Like U.S. Aircraft Carrier, Destroyers in Remote Desert", USNI News, 7 November 2021
121 Q1
122 Ministry of Defence (SOS001)

118. However, this figure conceals significant gaps in the availability of the Navy's escort fleet and is skewed by higher availability among less capable vessels. Availability of vessels by class ranges between 50–100% (see Table 4 below).

Table 4: Availability of Royal Navy vessels by class

Class	Upkeep/ Maintenance	Operationally Available	Total	Availability
Type 45 destroyers	3	3	6	50%
Type 23 frigates	4	8	12	67%
River Class Patrol Ships	0	3	3	100%
River II Class Patrol Ships	0	5	5	100%
RFA Tide Class	1	3	4	75%
RFA Wave Class	1	1	2	50%
RFA Landing Ship Docks	1	2	3	67%
Sandown Class	2	5	7	71%
Hunt Class Mine Counter Measure Vessels	2	4	6	67%
HMS Albion/HMS Bulwark	1	1	2	50%

Source: Figures for destroyers is for October 2021 (given at Qq283–285). Figures for all other vessels are for June 2021 (given at PQ 36545 on Type 23 Frigates, 26 July 2021). Total numbers of Sandown Class Minehunters differs from the total number given in Appendix 1, as it includes HMS Ramsey and HMS Blyth, which were decommissioned in August 2021.

119. Admiral Radakin outlined some of the measures the Navy had already taken to improve vessel availability, including changing its model for crewing some vessels:

> The traditional view was that a ship would be available for 60% of the time. That aligned with the way that we crew our ships in order to give people both their leave and some home-based port time. If you recall, we are adjusting some of the ways that we operate our ships. For HMS Montrose in the Gulf, we rolled the crews through so that the ship was available for far more of the time. The batch 2 OPVs have a one-in-three watch system that allows us to have those ships a lot more available. We are looking to do that with far more of the fleet. With a modern fleet, we are looking to get 80% availability out of those ships.[123]

120. Admiral Radakin also told us that the Navy had addressed the lack of spares that had delayed maintenance programmes, resulting in fewer ships being available for operations. When he was Second Sea Lord between 2018–19, the Navy had an average 50% of high-priority spares available at the start of a maintenance period, which has now increased to 90%. He also noted that the Navy had contracted with commercial companies to deliver

123 Q167

maintenance to forward deployed vessels in the Indo-Pacific, allowing them to remain in the region permanently and increasing their availability. Vice Admiral Gardner further highlighted efforts to improve the productivity of shipyards through the future maritime support programme and changing contracts to incentivise suppliers to meet targets.[124]

121. Part of the challenge the Navy faces with ensuring that vessels are available for operations is that maintenance programmes for ships are regularly delayed. All 11 maintenance projects started since 2019 finished later than planned and, while in 2017–18, four of 11 projects finished on schedule, four projects were completed within fourteen days of the scheduled period and the remaining three projects were completed within three months of the scheduled period. On average, programmes were delayed by a third of their scheduled time (roughly three weeks in the Royal Navy and eight weeks for Royal Fleet auxiliary vessels). These delays were all due to "the scale of work required only becoming evident when the upkeep period commenced" or, after 2020, to COVID. Notably, delays were not limited to one contractor: all companies that performed maintenance work for the Royal Navy (Babcock Marine, BAE Systems and UK Docks Marine Service) or Royal Fleet Auxiliary (A&P Falmouth and Cammell Laird) completed similar numbers of projects late.[125]

122. The Department has attributed the unexpected length of maintenance periods to the age of the vessels involved: as vessels become older maintenance becomes more challenging and delays more likely. This is likely to be particularly problematic in relation to the Type 23 frigates. The Navy plans to extend the time spent at sea by three of the frigates in order to compensate for the early retirement of two other Type 23s. However, as Serco told us:

> the quantity and duration of operational deployments that the Navy fulfils has–for much of this century–challenged both ships and people, so much so that they have been required to run 'hot'. This has had a direct impact on the availability of both, and significantly increased support costs.[126]

The Minister for Defence Procurement told us that maintenance programmes were expected to improve on new classes of vessels as digitisation allowed for more precise maintenance and management of spares.[127]

Type 45 Destroyers Power Improvement Project

123. Availability is lowest for some of the UK's most capable and important vessels, the Type 45 destroyers. At one point in July 2021 only one of six Type 45 destroyers was not undergoing maintenance: three vessels were undergoing planned deep maintenance or refit programmes; one was in planned maintenance; and one was "experiencing technical issues" (in layman's English, it broke down).[128]

124. The Power Improvement Project (PIP) is a particular challenge for availability of these ships and may already be behind schedule, based on the time taken to complete

124 Qq306–314
125 PQ 41708 on Naval and Royal Fleet Auxiliary: shipping, 8 September 2021; DEP2021–0831, 22 October 2021; DEP2021–0832, 22 October 2021; DEP2021–0749, 8 September 2021
126 Serco (NAV0029); Professor Caverley noted that the US Navy had had a similar experience of vessels spending too much time at sea Q1; Ministry of Defence (NAV0044)
127 Qq308–310
128 PQ 33140 on Type 45 Destroyers, 19 July 2021

the first vessel. Our predecessor Committee heard evidence that the PIP would take 12 months and would be done in parallel with planned maintenance periods to minimise out-of-service time.[129] In written evidence Mr Cope expressed disappointment with the 12-month estimate, claiming that Cammell Laird, the shipyard where the work is taking place, had suggested it could be done in 6–12 months.[130]

125. Updates on the progress of the PIP suggest this timeline may already be slipping. Both BAE and the Minister had stated in the summer that all six Type 45 ships will have undergone the PIP upgrade by the mid-2020s, subject to the availability of ships to undertake the upgrade and the Royal Navy's standing and future operational commitments. However, giving oral evidence in November, Vice Admiral Gardner updated this to report that the PIP would be completed by 2028. HMS Dauntless entered the PIP in early May 2020, a date the Navy Lookout website claims was already three months behind schedule. The timeline has been extended following a reassessment to account for the impact of the COVID-19 pandemic. It may be slipping further: BAE told us in August that HMS Dauntless was expected to complete the initial phase of the installation work "by the end of summer 2021". In September, the Minister said HMS Dauntless is expected to complete the initial phase by Q3 2021. In November, the Minister for Defence Procurement said Dauntless had "just finished PIP" but was still "working up to do sea trials". Despite this Vice Admiral Gardner told us the Navy was aiming to increase the availability of the Type 45s to four out of six by 2024 although not all of the four would have completed the PIP by this point. Admiral Radakin attempted to reassure us that the PIP was to improve the vessels' resilience, not to mend broken parts. However, we note that in July HMS Diamond suffered a failure of one of her engines, the fault that the PIP is intended to fix, and detached from CSG21 to remain in the Mediterranean for repairs. We remain concerned that our destroyers all face the same risk until the PIP is completed.[131]

126. **We welcome the Secretary of State's focus on improving vessel availability as it is crucial for the effective operation of the fleet. We recognise that the Navy has already taken measures to address it but are concerned that any improvements come from increased use of low-end warships, rather than improvements in the availability of Type 23 frigates and Type 45 destroyers. The availability of these vessels will be particularly important in the next decade to ensure the Navy's ambitious plans for the fleet can be delivered without capability gaps. However, availability issues are unlikely to improve significantly, and could potentially deteriorate further, until new frigates are introduced, and the Type 45 Power Improvement Project (PIP) is complete. *It is only prudent for the Navy, when it is setting strategic and operational goals over the period, to take a more realistically pessimistic view of UK capabilities than is currently the case.***

129 Defence Committee, Third Report of Session 2016–17, Restoring the Fleet: Naval Procurement and the National Shipbuilding Strategy, HC 221, 21 November 2016

130 Mr Christopher Cope (Parliamentary Correspondent at Warship World/ Navy Books) (NAV0007)

131 "HMS Dauntless Type 45 missile destroyer of British navy to be fitted with three new powerful engine", Navy Recognition, 7 May 2020; "Type 45 destroyer availability improving", Navy Lookout, 11 March 2020; BAE Systems (NAV0039); PQ 37383 on Type 45 Destroyers: Repairs and Maintenance, 7 September 2021; Q284–301

127. ***Reporting of availability must improve to avoid concealing issues with the availability of specific classes of vessel. The Ministry of Defence should report annually to Parliament in a written statement on the availability of all surface vessels in the Royal Navy and Royal Fleet Auxiliary by class. The answer to PQ 36545 on Type 23 Frigates, dated 26 July 2021, provides a model and demonstrates that the publication of data at this level of specificity does not compromise security. The Ministry of Defence should also make a classified report to this Committee including details of any times in the previous year when surface vessels were unexpectedly unavailable for more than a month and a list of surface vessels that are expected to enter a refit or maintenance for a year or more, or which are being mothballed, during the course of the following year.***

128. **The low availability of the UK's Type 45 destroyers and recognised issues in their propulsion systems are a major cause for concern. The destroyers cannot do their job or effectively deter adversaries if only half, and sometimes only one, of the six ships is available for operations at any time. The PIP that is intended to improve this situation is scheduled for completion in 2028 but there are indications that timelines may be slipping. We find it extraordinary that the Navy is prepared to wait seven years to fully repair these £1 billion destroyers, which are arguably the most powerful units in the surface fleet after the aircraft carriers.**

129. ***The Ministry of Defence should investigate claims that each PIP upgrade could be delivered in less than twelve months and confirm in its response what if any barriers there are to speeding up the programme. The response should also confirm whether an SRO has been appointed for the PIP. If not, one should be appointed and they should be prepared to provide the Committee with an annual report on the programme within six months of appointment, and then annually. If necessary, we will expect the SRO to answer additional questions on their programmes in a public evidence session.***

Submarine Availability

130. There have been numerous concerning reports in recent years about issues with the availability of the UK's submarine fleet. As far back as 2013 the Ministry of Defence recognised that delays to the delivery of the Astute class submarines meant that the Trafalgar class submarines had their operational lives extended, at very considerable cost. BAE told us that in recent years the delivery rate for the Astute was not in line with contract. They also told us that they now aim to improve delivery from one submarine every three years to three submarines by 2026.[132]

132 Ministry of Defence, "DNSR Annual Report 2021/2013", August 2013; BAE Systems (NAV0039)

Box 2: Attack Submarines - Astute to Dreadnought transition

There are currently four of the newer Astute class submarines in service with the Royal Navy (HMS Astute, HMS Ambush, HMS Artful and HMS Audacious) as well as two of the older Trafalgar class submarines (HMS Talent and HMS Triumph). The Government does not publish in-service dates of submarines due to security concerns, however they have said that the entry into service of each of the next two Astute class submarines will be synchronised with the retirement of a Trafalgar class. Seven Astute class submarines will be delivered in total.

- 2021—HMS Audacious completed sea trials in September (begun in April 2020). HMS Trenchant (a Trafalgar class submarine) retired in March.
- 2022—HMS Anson (the fifth Astute class submarine) due to begin sea trials. HMS Talent due to retire, after an additional one-year extension in service.
- 2023/2024 - HMS Triumph due to retire, after an additional eighteen-month extension in service. It's likely that the sixth Astute, HMS Agamemnon, will enter sea trials or service around this time.
- 2026 - Final Astute class submarine, HMS Agincourt, expected to enter service by the end of the year.

Source: PQ 10350 on HMS Audacious, tabled on 30 January 2020; Submarine Delivery Agency, "HMS Audacious sailed from Barrow in April", 9 November 2020; "Royal Navy Submarine HMS Anson Launched by BAE Systems", Naval News, 18 May 2021; Royal Navy, "Fourth Astute-class submarine formally commissioned", 23 September 2021; "UK to extend two Trafalgar-class submarines in service", Janes, 26 March 2021; "Duty done - farewell HMS Trenchant", Navy Lookout, 26 March 2021

131. Issues also extend to the ballistic missile submarines responsible for delivering the UK's nuclear deterrent. HMS Vanguard has been undergoing a refit in dock since 2015 and the reactor core has had to be replaced twice owing to concerns the original refit had a design defect. In October 2021 the Times reported that the "submarine is not expected to rejoin the fleet until the middle of next year at the earliest—four years late." Even if the Dreadnought class is delivered on time, the Vanguard-class SSBNs will now have to operate well beyond their original planned lifespans. Details on the availability of the submarine fleet cannot be shared publicly due to concerns that it will prejudice the capability, effectiveness and security of the UK's defence. However, Admiral Radakin acknowledged that "our overall submarine availability is weak" and that similarly to the surface fleet the Navy was aiming to improve availability by bringing in the new Astute and Dreadnought class submarines. He nevertheless noted that UK submarine availability was on par with US and Australian counterparts. Admiral Radakin also provided robust reassurance of the availability of the nuclear deterrent in particular, saying:

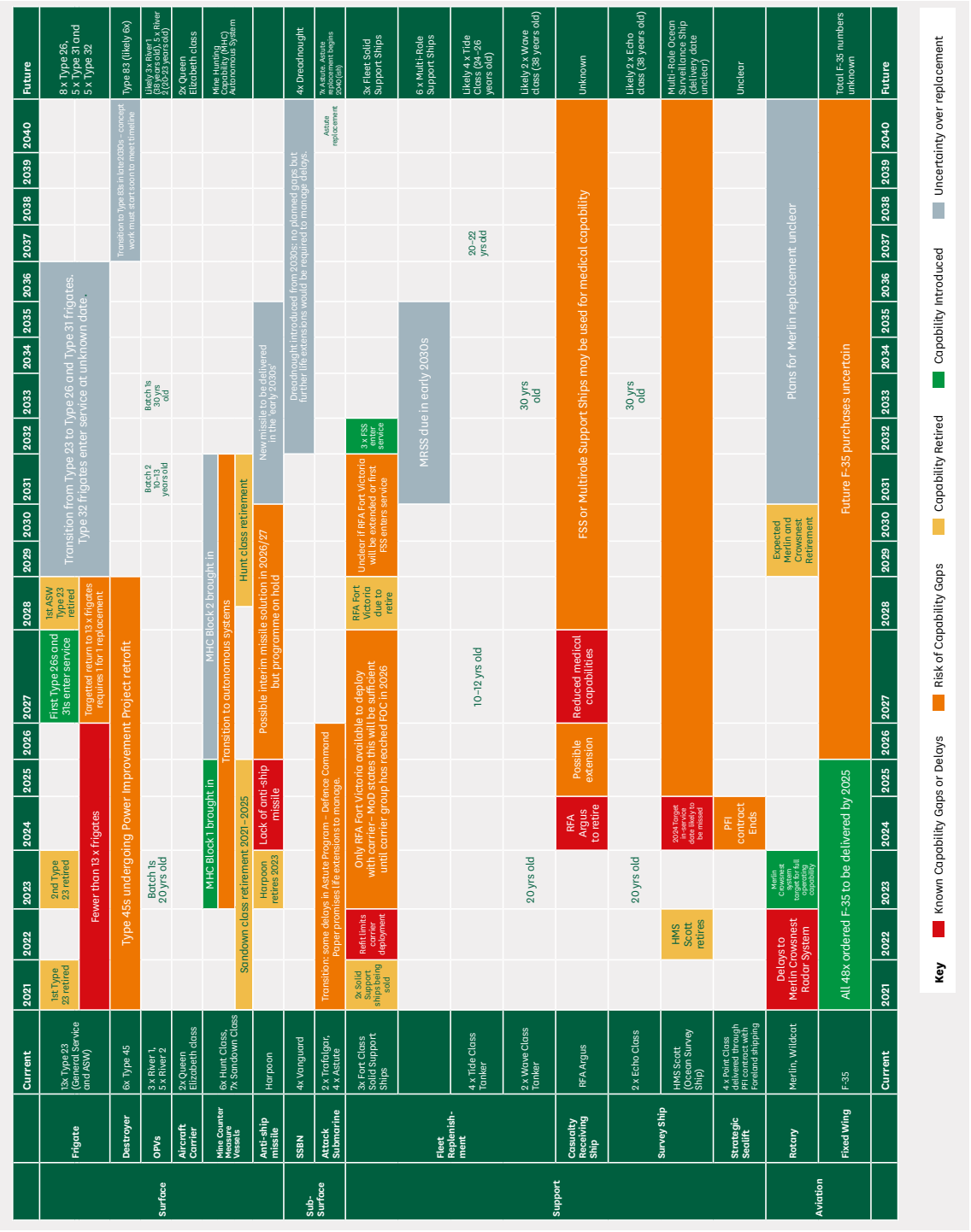
> I am absolutely confident that we have maintained that [nuclear deterrent] patrol in the same way that we have done for the past 52 years. It continues to be invulnerable. I would actually go further and say that some of the investment we have made has made it less vulnerable than it was even a year ago.[133]

133 Q238; "Babcock under MoD watch over submarine contract", Financial Times, 12 November 2018; "Critical Royal Navy submarine refit running late", Navy Lookout, 3 August 2019; "Millions sunk into seven-year refurb of Trident submarine", The Times, 10 October 2021; "UK nuclear challenges: keeping 'CASD' afloat", International Institute for Strategic Studies, 22 May 2020; Q240

132. **The Astute class represent arguably the best attack submarine in the world, but they cannot effectively deter anyone until they are actually in service; therefore we cannot afford any further delay in the delivery of the remaining Astute boats. We are concerned by reports that submarine availability is weak, and not reassured by learning that the US and Australian submarine fleets are no better. Reported issues with the availability of the Vanguard class submarines that deliver the nuclear deterrent mean that the Dreadnought successor programme must be brought in on schedule, as further life extensions cannot be relied upon to fill in any gaps.** ***The Ministry of Defence should set out in its response appropriate arrangements it will use to ensure that we are briefed on submarine availability once a year, with due regard to both security and the importance of scrutiny to ensure effective delivery.***

4 Shipbuilding and the Future Fleet

Navy Tranisition Chart



Source: Ministry of Defence (NAV0030); Ministry of Defence (NAV0044); Qq171–173; Q288; Qq181–183; Q184; Ministry of Defence "Defence in a Competitive Age", March 2011, pp49–50,54; Ministry of Defence (NAV0045); "DSEI 2021: UK MCM Follows A New Course" Naval News, 17 September 2021; "UK to develop new class of nuclear submarine", UK Defence Journal, 23 March 2021; Ministry of Defence "Defence Equipment Sales Authority 2021", pp5,13; National Audit Office "Carrier Strike—Preparing for deployment", 18 June 2020, 2.17; Mr Robert Clark (Research Fellow, Global Britain Programme at Henry Jackson Society) (NAV0038); Gabriele Molinelli (NAV0002); Public Accounts Committee, 23 Report of the Session 2019–2021, Delivering Carrier Strike, HC 684, paras 6,22; "Crowsnest to be retired by decades' end", Naval Technology, 12 May 2021; PQ 40646 on Merlin Helicopters, 6 September 2021, "UK extends Merlin operations until 2040" Flight Global, 11 June 2021

The Current Shipbuilding Pipeline

133. Over the next 20 years the Royal Navy is planning to replace many types of vessels in its fleet with new ones. The chart above shows all planned transitions:

You Wait Six Years for a New Warship …

134. The next six years will see a decrease in the number of frigates, Type 45 destroyers still going through the PIP, and only one Fleet Solid Support ship available. The Navy must deal with this while also managing its growing role in an increasingly complex security environment (outlined in Chapter 2) and changing the way it operates due to an effective decrease in its resource budget (outlined in Chapter 3).

135. The 2015 Strategic Defence and Security Review promised that the Joint Force 2025 would have 19 destroyers and frigates. However, the DCP announced that two frigates would be retired early. HMS Monmouth was retired in July 2021 and Admiral Radakin confirmed to us the HMS Montrose will be retired in July 2023. Although he reassured us that overall vessel availability will increase, as outlined in Chapter 3, it does mean that the Navy will have at least two fewer frigates than Joint Force 2025 envisaged.[134]

136. In addition, there are also specific concerns about capability gaps resulting from the retirement of certain vessels:

- RFA Argus will retire in 2024 without a replacement specified. Admiral Radakin confirmed that there was a potential gap in current plans. Potential mitigations being explored by the Navy include a short extension until 2026 or modular containers on vessels to provide basic medical facilities. He suggested that the Navy might be able to use the Fleet Solid Support ships or planned Multi Role Support Ship to deliver medical capabilities towards the end of the decade. Until then the fleet's medical capabilities will be limited;[135]

- The last remaining solid support ship, RFA Fort Victoria, is due to retire in 2028. The contract notice requires delivery of three FSS ships by 2032, but it is unclear when the first ship will be delivered and whether one will be operational in time, or if there will be a capability gap. The Minister for Defence Procurement told us that the Department believes the first replacement vessel can be ready in time but that if not , RFA Fort Victoria could be extended—this would present its own challenges around delivering a maintenance programme on schedule and maintaining availability for an elderly vessel, as noted in Chapter 3. The Society of Maritime Industries has already predicted that an extension will be necessary;[136] and

- Robert Clark of the Henry Jackson Society warned us that the lack of a tender for the Multi-Role Ocean Surveillance Ship meant that the Department was unlikely to meet the target 2024 in-service date. We have been told the vessel is crucial for monitoring UK at sea critical national infrastructure (such as undersea fibre optic cables) to guard against interference from adversaries, particularly Russia.

134 HM Government, "National Security Strategy and Strategic Defence and Security Review 2015", November 2015, p28; Ministry of Defence (NAV0044)

135 Q184

136 Qq181–183; Society of Maritime Industries (NAV0032)

> Commercial options for this ship do exist but as the Department has said it will be included in the National Shipbuilding Strategy pipeline (outlined below) it does not appear to be planning to use these.[137]

137. An additional capability gap comes from the failure to deliver the Crowsnest early warning system on time. The system was due to reach Initial Operating Capability in March 2021 to support CSG21, and full operating capability in June 2022. However, in November 2020 the Public Accounts Committee found the Crowsnest radar system had been delayed by 18 months and that this "will affect Carrier Strike's capabilities for its first two years of operation." Operating capability is now not expected until 2023. The Crowsnest Merlins accompanying the 2021 carrier deployment carried a "pre-Initial Operating Capability" which is not fully certified, but which the government has said will give "key functionality that the Royal Navy defined as required to provide a credible operational capability". The government has said there will be two further major capability insertion points planned which are largely software based, before Full Operating Capability is reached. However, the Infrastructure and Projects Authority continues to rate Crowsnest as Red in their latest report, indicating that success is far from assured. This is a critically important programme which must be put right without further delay, to ensure the air defence of the fleet.[138]

138. We asked the Minister for Defence Procurement what the Navy would do if it was required to fight a serious adversary in this period of risk. He told us:

> I think the First Sea Lord said it right at the start. We have a large range of capabilities under the surface, on the surface and with F-35 above it. We would be working alongside allies and partners, and we would ensure that we have the right capabilities to meet the threat.[139]

We are not as sanguine as the Minister about the ability of the Royal Navy, in its current state, to engage in a full-on conflict with a peer adversary. History shows repeatedly that underestimating your potential adversaries can lead to unfortunate outcomes.

Managing the shift to uncrewed mine hunting

139. Throughout this period the Navy will also need to be managing a major shift from crewed to uncrewed mine hunting.[140]

140. Witnesses predict that autonomous mine hunting will improve the Navy's capabilities. They agree with the Secretary of State's statement to the House that "Automated mine-hunting can currently cover, in key points, far more area than a ship, and it is really important for some parts of the patrols and areas that we cover". Sam McBriar, Director of Strategic Marketing for Maritime, Thales UK, confirmed to us that sea trials had

137 Mr Robert Clark (Research Fellow, Global Britain Programme at Henry Jackson Society) (NAV0038); Dr Sidharth Kaushal (NAV0037)

138 National Audit Office, "Carrier Strike – Preparing for deployment", 26 June 2020; Letter from the Permanent Secretary to the Chair of the Public Accounts Committee on 26 February 2021; Infrastructure and Projects Authority, "Annual Report on Major Projects 2020–21", 15 July 2021, p52

139 Q267

140 The introduction of the mine hunting capability is aligned with the Sandown class drawdown between 2021- 25 (Ministry of Defence (NAV0030)).

shown "these autonomous systems could do the same job as the conventional systems." Witnesses presented the autonomous systems as a much more efficient way of conducting what Admiral Vaujour called "a very boring mission".[141]

141. However increased reliance on autonomous vessels also presents new challenges (outlined in Chapter 4) and the Department has acknowledged that during this transition "while modernising, there is a degree of operational risk, as conventional capabilities come to the end of their service lives and new technology comes into service".[142] In the case of uncrewed mine hunting, this will involve combining autonomous vessels effectively with crewed vessels, either to provide a mothership capability or the additional deterrent effect currently provided by mine hunting vessels in regions such as the Gulf and Indian Ocean under Operation Kipion.[143]

142. In earlier evidence the Ministry of Defence told us that "Gulf assets will be operated from the in-theatre Landing Ship Dock (Auxiliary) but could be operated from shore with the agreement of the host nation." Using a Landing Ship Dock would add another task to the high level of demand for the Bay class already noted in Chapter 3. Vice Admiral Gardner told us that the Navy was looking at what sort of mothership capability could come through the multi-role support ship (once delivered), or through "the rapid procurement of existing vessels to provide some early capability and the ability to carry out some experimentation and trialling".[144] Witnesses suggested that Type 26 and Type 31 vessels would be unsuitable for the role, as it would involve tying up a limited number of frigates and destroyers. Instead, other suggestions for potential motherships include: building dedicated OPV-like vessels as Belgium and the Netherlands will do; refitting the Hunt class; or designing the Type 32s or replacement for the Batch 1 River class OPVs or Echo and Enterprise multi-role survey vessels to accommodate them. The Navy might have to decide which course to pursue quickly, as it might be challenging to procure these vessels before the Hunt and Sandown class retire between 2029–31 and 2021–25 respectively.[145]

143. In addition, there are also concerns about whether the mine hunting transition will be properly funded, as the NAO report on the Defence Equipment Plan 2020–2030 notes:

> The Plan excludes the full costs of buying equipment that TLBs [top-line budgets] will need to replace existing capabilities as they become obsolete, such as the Navy's mine-hunting capability.[146]

Resolving these issues puts additional pressure on the Navy in a sensitive period.

144. **The next decade is one of significant risk for the Royal Navy's fleet. During a period when it is being expected to take on increased responsibilities in a deteriorating international security environment, the Navy will be relying on a mix of elderly vessels**

141 HC Deb, 22 March 2021, col 660 [Commons Chamber]; Defence Synergia (NAV0006); Gabriele Molinelli (NAV0002); Ministry of Defence (NAV0030); Oral evidence taken on 13 April 2021, HC (2019–21) 1333, Qq87–90; Oral evidence taken on 25 May 2021, HC (2021–22) 166, Q11; Q63

142 Ministry of Defence (NAV0045); Ms McBriar also told us that Thales acknowledged the risk of the transition, although noting the Navy owned the risk-reduction plan, and said Thales had worked with the Navy to mitigate it through a phased transition (Qq64–68).

143 Ministry of Defence (NAV0030)

144 Q24, Qq248–249; Ministry of Defence (NAV0045)

145 Gabriele Molinelli (NAV0002); Society of Maritime Industries (NAV0032); PQ 40720 on Minesweepers, 6 September 2021

146 National Audit Office, "The Equipment Plan 2020–2030", HC (2019–21) 1037, p8

(like the Type 23 frigates) and new and untested assets and processes (like the uncrewed mine countermeasures), while also being constrained by a tight budget for operations and maintenance that will force it to change how it operates. In addition, crucial programmes like the Crowsnest early warning system, the Type 45 Power Improvement Project and introduction of the Naval Strike Network will not be completed for several years, all of which incurs risk. The Navy will also be forced to carry capability gaps in medical facilities and anti-ship missiles, because of the retirement of RFA Argus and Harpoon, and likely also in its ability to monitor critical national infrastructure and deliver support shipping and logistics, because of the uncertain in-service date of the Multi-Role Ocean Surveillance Ship and delays to the Fleet Solid Support ship programme. The lack of Fleet Solid Support ships is a particular concern because it threatens the Navy's ability to deliver a force with a sovereign core that can act independently of allies.

… then Three Come Along at Once

145. In 2027–28 the Navy's current plans are to introduce three new classes of vessels (Type 26, Type 31 and FSS) simultaneously. The Minister for Defence Procurement described the planned transition in which Type 23 frigates will be replaced by Type 26 and Type 31 frigates ship for ship:

> We have a demanding schedule because we are bringing a lot more surface vessels into the service of the Royal Navy. The objective is to ensure that there is no capability gap—that HMS Glasgow, the first of class of the Type 26 ASWs, comes in to match the coming out of service of HMS Westminster, the first of the Type 23 ASWs to come out, and that we have the Type 31s coming in regularly to replace the retiring general purpose Type 23s.[147]

146. Admiral Radakin noted that one of the big challenges of the transitions between classes is likely to be to the need to crew both old and new vessels simultaneously for a period. He reported that due to positive recruitment numbers he was optimistic about the Navy's ability to do this, although we note that the pressure on RDEL outlined in Chapter 3 is likely to put pressure on the payroll budget unless cuts are made elsewhere.[148]

How reliably does the Navy deliver new programmes?

147. As several inquiries by this Committee, our predecessors and others have made clear, the Ministry of Defence has a terrible history in delivering procurement programmes.[149]

148. In a recent report, the Public Accounts Committee concluded that it was:

> extremely disappointed and frustrated by the continued poor track record of the Department and its suppliers—including significant net delays of 21 years across the programmes most recently examined by the National Audit Office—and by wastage of taxpayers' money running into the billions. …

147 Q162; Q171

148 Q162

149 Mr Ian Holder, and Professor David Kirkpatrick (DIP0007), Mr Barry Joseph (Senior advisor at Viasat UK) (DIP0006), Mr Darwin Friend (Researcher at Taxpayers' Alliance) (DIP0008), Commander Nigel MacCartan-Ward DSC AFC RN (ret'd) (DIP0004)

> To meet the aspirations of the Integrated Review, the Department's broken system for acquiring military equipment needs an urgent rethink, led by HM Treasury and the Cabinet Office.[150]

The PAC affirmed our own findings related to the risks inherent to delayed procurement and maintenance programmes (set out in Chapter 3) in adding:

> delaying the entry into service of new capabilities can mean the Department has to rely on ageing equipment and in some cases, equipment which is becoming obsolete. For example, delays encountered on the Department's two frigate programmes mean predecessor vessels had to be upgraded to stay in service.[151]

149. In addition to the Ministry of Defence's general procurement difficulties, there are also specific production challenges in shipbuilding. These include: the relatively slow rate at which vessels are produced in the UK;[152] potential labour shortages resulting from a large number of concurrent projects and a lack of skilled workforce, particularly in marine welding, plating and fabrication, pipe fitting and mechanical fitting;[153] and the concentration of work in particular yards leading to the risks of knock-on delays.[154]

150. The Type 26 and Type 31 frigates face project specific challenges from the design and build of first of class vessels.[155] BAE has provided us with an overview of specific risks in the Type 26 programme and explained the measures they have put in place to manage them. These include supply chain risks, engineering or software design not maturing in time, issues with integration of equipment and COVID-19 impacts. David Lockwood, CEO, Babcock, confirmed that the Type 31 programme faced many similar risks, in addition of the start-up risk of a new dockyard. Glynn Phillips, Group Managing Director, Maritime and Land, BAE, also informed us that the Type 26 programme had had historic issues with the "first of class gear box", including difficulties meeting the exacting specification for operating extremely quietly. He believed that these issues had been resolved but noted the gear box was still going through testing.[156]

151. The failure of the Crowsnest programme mentioned earlier demonstrates the very real danger these risks present to naval capability. This crucial enabler is not available for the Royal Navy because of a combination of ineffective oversight of subcontractors, software not being sufficiently mature, issues that were identified during qualification and

150 Committee of Public Accounts, Twenty-Second Report of Session 2021–22, Improving the performance of major defence equipment contracts, HC 185, p3

151 Committee of Public Accounts, Twenty-Second Report of Session 2021–22, Improving the performance of major defence equipment contracts, HC 185, pp10–11

152 Harland & Wolff (NAV0023)

153 Letter dated 24th June from Intermarine UK to the Chair on Brexit, Immigration, Pre-Settled / Frontier Worker Status in support of Strategically Important Shipbuild Projects; BAE Systems (NAV0039); The APPG for Shipbuilding and Ship Repair's report "The Maritime Skills base within UK Sovereign Defence Capability", June 2021 also reached similar conclusions.

154 Philip Dunne (NAV0028)

155 Q162

156 BAE Systems (NAV0039); Qq71–75 Babcock also shared a copy of the risk register for the Type 31 with us, however owing to different contractual requirements this cannot be published.

trial activities and required a redesign, and errors by the companies involved. We are not reassured by assertions from Lockheed Martin and Thales that "Lessons have been learnt." We would far prefer it if they comprehensively fixed the problem.[157]

152. **Towards the end of this decade the Navy intends to bring in several completely new classes of vessels simultaneously. These plans must be delivered on schedule if the Navy is to avoid capability gaps and end the period of risk it has created through its own planning and procurement decisions. We welcome indications that these programmes are currently on target. However, past performance is not encouraging, and numerous risks have been identified. The security of the fleet and the UK rely on these projects being delivered on time. Given the challenges associated with the age of the vessels, like the provision of spare parts, we are far from confident that any delays can be effectively managed by extending the life of ageing vessels without additional risk.**

153. Uncertainty over whether the Navy can deliver the vessels as scheduled is heightened by constantly changing predictions of when vessels will be in service and the lack of any published overarching plan for how many vessels will enter and exit service each year. In our oral evidence session the Minister for Defence Procurement refused to say which year the first Type 26 frigates might come into service.[158]

154. He also told us that the Navy was now hoping to have the first Type 31 frigates "coming in" before 2027. It is unclear if this is a change to the previously reported timeline, under which the first ship would be in the water in 2023 and then in service by May 2027, and all ships would be accepted off-contract by 2028. Mr Lockwood confirmed this timeline to us, adding that following contractor and Navy trials the first ship was meant to be accepted off-contract in 2025.[159]

155. Such lack of transparency and vacillation contrasts poorly with the practice in the US, where each year the Navy submits a report describing the planned inventory, purchases, deliveries, and retirements of the ships in its fleet for the next 30 years. The plan includes tables showing the number of vessels by category that the US Government expects to procure, deliver and retire each year and the projected number of ships in service in each category on the last day of each fiscal year. Examples of these tables are below.[160]

Table 6. Battle Force Inventory

Fiscal Year	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
Aircraft Carrier	11	11	12	11	11	10	11	11	11	11	11	11	11	11	11	11	11	11	10	11	10	10	10	11	10	10	9	10	10	10
Large Surface Combatant	91	92	92	95	96	97	100	101	100	97	94	92	88	86	85	87	86	83	80	78	75	75	73	74	74	74	74	74	74	74
Small Surface Combatant	34	37	35	35	36	34	36	39	42	45	49	53	55	58	62	64	67	69	71	69	69	66	66	66	65	63	63	63	66	68
Attack Submarines	52	54	53	52	50	53	53	55	54	56	58	57	58	61	63	64	62	62	64	64	67	68	70	72	74	75	77	79	79	80
SSGN / Large Payload Submarine	4	4	4	4	2	1																						1	1	1
Ballistic Missile Submarines	14	14	14	14	14	13	13	13	12	13	13	13	13	13	13	13	13	12	12	12	12	12	12	12	12	12	12	12	12	12
Amphibious Warfare Ships	31	28	26	27	29	32	35	37	40	42	44	47	48	52	55	57	61	62	63	64	64	64	64	66	65	63	61	62	62	62
Combat Logistics Force	31	31	32	32	32	35	37	39	40	43	45	48	50	52	54	56	58	61	62	63	65	66	66	69	70	69	69	68	69	69
Support Vessels	37	39	41	45	46	47	48	49	48	49	49	47	45	44	42	41	40	38	36	37	36	35	35	33	32	31	30	29	29	29
Total Naval Force Inventory	305	310	309	315	316	322	333	344	347	356	363	368	368	377	385	393	398	398	398	398	398	396	396	403	402	397	395	398	402	405

157 National Audit Office, "Carrier Strike – Preparing for deployment", 26 June 2020; Lockheed Martin (NAV0034), Q91

158 Q173

159 Q165; D/PUS/11/7/1(11); Babcock International (NAV0027); Q97

160 "Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels" Office of the Chief of Naval Operations, US Navy, 9 December 2020

Table 4. Battle Force Delivery Plan

Fiscal Year	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
Aircraft Carrier			1				1				1					1				1				1				1		
Large Surface Combatant	3	3	2	3	2	4	5	2	2	2		1		1	1	2	1	1	1	1	2	3	2	4	2	2	3	2	2	2
Small Surface Combatant	4	3	2		1	2	2	3	3	3	4	4	2	3	4	2	3	2	3	1	3	2	3	3	3	2	3	2	3	2
Attack Submarines	2	2	3	1	1	4	2	2	2	3	3	2	2	4	2	2	3	1	4	3	3	3	3	3	3	2	3	3	2	3
Ballistic Missile Submarines							1			1	1	1	1	1	1	1	1	1	1	1										
Large Payload Submarine																												1		
Amphibious Warfare Ships		1	1	2	3	3	4	3	3	2	2	3	2	4	3	3	4	1	2	1	1			4	3	2	2	4	2	2
Combat Logistics Force	1	2	1	1	1	5	3	3	3	4	3	3	3	3	3	3	3	3	1	1	2	1		3	2	4	4	4	4	4
Support Vessels	5	4	3	4	2	2	2	3	1	2								1		1										
Total	15	15	13	11	10	20	20	16	14	17	14	14	10	16	14	14	15	10	12	10	11	9	8	18	13	12	15	17	13	13

Table 5. Battle Force Retirement Plan

Fiscal Year	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
Aircraft Carrier				-1		-1					-1					-1			-1		-1				-1		-1			
Large Surface Combatant	-6	-2	-2		-1	-3	-2	-1	-3	-5	-3	-3	-4	-3	-2		-2	-4	-4	-3	-5	-3	-4	-3	-2	-2	-3	-2	-2	-2
Small Surface Combatant			-4			-4													-1	-3	-3	-5	-3	-3	-4	-4	-3	-2		
Attack Submarines	-2		-4	-2	-3	-1	-2		-3	-1	-1	-3	-1	-1		-1	-5	-1	-2	-3		-2	-1	-1	-1	-1	-1	-1	-2	-2
Cruise Missile Submarines					-2	-1	-1																							
Ballistic Missile Submarines						-1	-1		-1		-1	-1	-1	-1	-1	-1	-1	-2	-1	-1										
Amphibious Warfare Ships	-1	-4	-3	-1	-1		-1	-1					-1			-1			-1		-1			-2	-4	-4	-4	-3	-2	-2
Combat Logistics Force		-2		-1	-1	-2	-1	-1	-2	-1	-1		-1	-1	-1	-1	-1								-1	-5	-4	-5	-3	-4
Support Vessels	-1	-2	-1		-1	-1	-1	-2	-2	-1		-2	-2	-1	-2	-1	-1	-3	-2		-1	-1		-2	-1	-1	-1	-1		
Total Naval Force Retirements	-10	-10	-14	-5	-9	-14	-9	-5	-11	-8	-7	-9	-10	-7	-6	-6	-10	-10	-12	-10	-11	-11	-8	-11	-14	-17	-17	-14	-9	-10

Source: "Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels" Office of the Chief of Naval Operations, US Navy, 9 December 2020

156. **Proper scrutiny is essential to ensure programmes are delivered on time.** ***In order to allow for proper scrutiny of ongoing programmes, the Ministry of Defence should emulate the US Department of Defense and provide Parliament with an annual shipbuilding plan, including the number of ships planned to enter and leave service each year in the next 30 years. We ask that the Senior Responsible Owners for the Type 26, Type 31, Astute and Dreadnought programmes provide the Committee with an annual report on each of their programmes within six months of the publication of this report, and then annually. If necessary, we will expect the SROs to answer additional questions on their programmes in a public evidence session.***

A Plan for the British shipbuilding industry

157. The updated version of the National Shipbuilding Strategy (NSbS) promised by the 2021 DSIS has been repeatedly delayed. Initially thought to be due this summer, it now seems unlikely that the report will be delivered before the end of the year, as the Secretary of State for Defence promised in September.[161] The new NSbS will include plans for:[162]

- Three Fleet Solid Support ships;
- A Multi-Role Ocean Surveillance Ship (MROSS);
- Up to five Type 32 frigates;
- Up to six Multi-Role Support Ships (MRSS); and
- Type 83 destroyers (numbers unknown).

DSIS also said that the updated NSbS would consider elements of the shipbuilding industry beyond Defence-funded vessels, including companies providing systems and components for as well as Offshore Wind vessels.

161 Ministry of Defence, "Defence Secretary announces National Shipbuilding Office", 14 September 2021
162 Ministry of Defence "Defence and Security Industrial Strategy", March 2021, p91

158. The previous NSbS was written in 2017. It set out two objectives:

a) A Royal Navy with more ships, which are modern and are capable of being incrementally modernised and improved, are exportable and can work with allies. Defence shows agility, pace and grip in how we plan for, procure, and operate these ships.

b) A shipbuilding enterprise that, encouraged by a clearer grip by Defence, and with greater certainty about the Royal Navy's procurement plans, has the confidence to invest for the long term in its people and its assets to raise productivity and innovation and improve its competitiveness in the domestic and overseas markets. In this way, the sector can become more resilient to the peaks and troughs of Royal Navy business, bringing more sustained growth and prosperity to the regions in which those businesses are based.

Blueprints for a Shipbuilding Industry

159. There have been at least four separate studies of the UK shipbuilding industry in the past 15 years: by RAND in 2005; Sir John Parker's report to inform the NSbS in 2016 and his review of its implementation in 2019; Philip Dunne MP's study into defence and the prosperity agenda; and a report by the APPG for Shipbuilding and Ship Repair in 2019. These studies have all reached similar conclusions:[163]

- Calling for greater collaboration and partnership between the Government and UK industry.
- Advising the Government to ensure a steady drumbeat of work for UK shipyards with a long-term (potentially 30-year) shipbuilding plan. This would avoid the cycle of losing and then regenerating skilled labour and would provide assurance to industry to encourage investment.
- Supporting the principle of building ships in the UK over international competition. (Mr Dunne's report recommended appropriately weighting the social value of projects; Sir John Parker's review recommended defining more classes of ships as warships.)
- Recommending that the Government strategically encourage collaboration between yards. This would involve "marshalling shipbuilding capacity" in the model of the Aircraft Carrier Alliance to support smaller yards and avoid capacity constraints at the Tier 1 yards of Govan and Rosyth. Sir John Parker's review described this as a "virtual shipbuilding industry model" in which smaller regional shipyards would build fully outfitted blocks that would be integrated by a lead shipyard.
- Suggesting that most vessels should be designed for the export market from the start.

163 RAND, "Can the United Kingdom Rebuild Its Naval Fleet?", 2005; Sir John Parker, "Report on a national shipbuilding strategy", 2016; Sir John Parker, "Review of the implementation of the National Shipbuilding Strategy", 2019; Philip Dunne MP, "Growing the Contribution of Defence to UK Prosperity", 2018; APPG for Shipbuilding and Ship Repair "Inquiry into the National Shipbuilding Report", May, 2019

160. Sir John Parker's review made a number of additional technical recommendations about how the Ministry of Defence and the Navy should manage the procurement process for new vessels. He reiterated to us that these were for programmes to be delivered at pace and that the Ministry of Defence needed to ensure it had a grip of timescale and cost. He stressed that programmes must have an assured capital budget. He strongly cautioned against previous governments' practices of delaying projects to divert funds to cover gaps elsewhere, as this increases costs overall. Governments have generally done this when there have been pressures on the resource budget, as there will be for the next few years.[164]

161. Almost all our witnesses to our inquiry agreed with these recommendations and were in favour of the Ministry of Defence forgoing competition in procurement in order to provide certainty to the industry.[165] Only one witness, Jag Patel, disagreed with this assessment, arguing that the basic economic principle that competition drives improvement in products, cost and service should be applied to the shipbuilding sector.[166] However, Professor Taylor argued that the unique characteristics of the shipbuilding industry make this approach impractical:

> In the UK, reconciling national shipbuilding capabilities with competitive tendering is difficult, even logically impossible. In practice, competitive tendering in markets where there are only two or three suppliers, where entry barriers for new firms are high, and when there is a single key customer that places an order only every decade or more, often produces unintended consequences. Companies desperate to win a rare contract make highly optimistic offers, delivery is then late and over budget and all parties are unhappy. The unsuccessful bidder(s) then may leave the sector, thus reducing the possibilities for competition in future. These types of developments can also occur down into supply chains when there are few possible providers.[167]

162. Witnesses also supported the proposal that the Government should marshal national shipbuilding capacity and force primes, yards and subcontractors to cooperate. Many called for the Government to repeat the model of the Aircraft Carrier Alliance, under which the winning bidder adopted preferred sub-elements from a competitor's proposal in collaboration with them and the Ministry of Defence.[168]

163. Several witnesses observed that this would help to balance capacity in the shipbuilding industry. Harland & Wolff shipyard said, "The high concentration ratio in the naval shipbuilding market causes delays in the delivery of vessels of all classes" and called for greater outsourcing to smaller yards like theirs to address this. Mr Dunne similarly argued that yards other than Barrow, Govan and Rosyth have capacity, noting that there are separate naval design houses also able to engage in future competitions. Babcock agreed

164 Qq37–38

165 Confederation of Shipbuilding and Engineering Unions (NAV0031); Babcock International (NAV0027); Society of Maritime Industries (NAV0032); Philip Dunne (NAV0028); Professor Trevor Taylor (Director, Defence, Industries & Society Programme at RUSI) (NAV0013); ADS (NAV0015); Sam McBriar (Thales), David Lockwood (Babcock), Glynn Phillips (BAE) Q107

166 Jag Patel (NAV0003)

167 Professor Trevor Taylor (Director, Defence, Industries & Society Programme at RUSI) (NAV0013)

168 Confederation of Shipbuilding and Engineering Unions (NAV0031); Q40; Babcock International (NAV0027); Society of Maritime Industries (NAV0032); Philip Dunne (NAV0028); Professor Trevor Taylor (Director, Defence, Industries & Society Programme at RUSI) (NAV0013)

in its evidence that other yards have capacity and that "distributed build programmes can engender collaboration and spread value across the UK whilst protecting the Tier 1 and Tier 2 yards from too much risk exposure".[169]

164. However, this approach would not be without its challenges. Mr Dunne warns "The more yards we have in production the more clarity is required over sequencing and scheduling of a programme of vessel upgrade and type replacement." Mr Lockwood and Mr Phillips concurred saying, "the more complex you make the build arrangements, the more difficult it is to manage change." Mr Patel argued that increased reliance on subcontractors disguises inefficiencies in defence manufacturers' operating models.[170]

165. The Defence Secretary told us in June that he was attempting to drive work in smaller yards in the FSS contract by requiring the prime and the yard to be split, as part of the contract. He told us that it would help increase productivity in UK yards to levels comparable with other European yards and prepare them to be competitive without Royal Navy contracts. However, most witnesses, including Harland & Wolff, who agreed on the need to increase productivity, argued that his focus on driving this change through international competition and making sure "the primes have to work for it", went against the strong recommendation from all studies that the Ministry of Defence and industry should work collaboratively to increase productivity. Sir John Parker told us that a sustained volume of work for British shipyards, rather than competition, "is actually a prerequisite, in my view, for driving productivity". Ian Waddell, General Secretary, Confederation of Shipbuilding and Engineering Unions, went further:

> There is a myth inside some of the corridors of power in the MoD that somehow British yards are uncompetitive and inefficient, that the companies are greedy in some way, and that the only way you can deal with that is to expose them to the cut and thrust of global competition in order to drive the prices down and drive the efficiency up. It is a complete fallacy. That is just not the way that the industry works. It is not the way that the companies operate.[171]

Both Mr Waddell and Sir John Parker also disputed the premise that UK yards were significantly less productive or competitive than foreign yards, with Mr Waddell contending that foreign yards were artificially subsidised. Professor Taylor argued strongly that the UK's ability to deliver complex warships on time and on budget was in line with US and European navies.[172]

166. During our inquiry, we sought international comparisons with the UK's experience. Witnesses and resources from Australia and Japan identified similar lessons to these four UK studies, such as: the importance of "a sense of teamwork" between the Government and industry; the importance of ensuring a continuous pipeline of work (in Australia's

169 Harland & Wolff (NAV0023); Philip Dunne (NAV0028); Babcock International (NAV0027)

170 Philip Dunne (NAV0028); Q102; Jag Patel (NAV0003)

171 Oral evidence taken on 23 June, HC (2021–22) 166, Qq146–9; Jag Patel (NAV0003) supported this approach. Harland & Wolff (NAV0023). Harland & Wolf, supported by Mr Christopher Cope (Parliamentary Correspondent at Warship World/ Navy Books) (NAV0007) claimed in particular that UK shipyards were slower than international competitors, although this was disputed by Sir John Parker and Mr Lockwood in oral evidence (Qq50,95); Q44

172 Qq43–52; Professor Trevor Taylor (Director, Defence, Industries & Society Programme at RUSI) (NAV0013)

case covering 50 years) while also encouraging some competition between smaller yards;[173] and the need to select a mature design at the start of the build, limiting changes once production starts as well as limiting the number of unique national design changes.[174]

167. The Australian government also decided to take an active role in managing workforce issues, including by establishing a Naval Shipbuilding College, although industry was left to make commercial decisions on workforce and skilling. The Canadian government's national shipbuilding strategy has similarly prioritised ensuring that the country has the necessary skills and workforce to sustain the shipbuilding industry; its latest annual shipbuilding report highlights how a change was made in the sequencing for the construction of their Joint Support Ships in order to retain the workforce at Seaspan's Vancouver Shipyards.

168. When we asked the Minister how the UK was remedying shipbuilding skills gaps, he promised that the NSbS "will refer to the skills that we need to have in order to have a flourishing shipbuilding enterprise". He also noted the investments that had been made in the Maritime Enterprise Zone and by industry in building skills academies and indoor shipbuilding facilities. However, we note the findings of Sir John Parker's 2019 review that more focus was needed from the MoD Head Office, Strategic Programmes and Prosperity teams on delivering his 2016 recommendation that industry, Government and trade unions should work to create high skilled jobs and drive recruitment.[175]

The Type 31: A Model Procurement

169. Witnesses also praised the success so far of the Type 31 procurement model—particularly for its engagement with industry in the procurement process—with many calling for it to be replicated in future. The process largely followed the advice of Sir John Parker's 2016 review. In particular: the process proceeded at pace and was firmly controlled by the MoD; there were no design modifications after the contract was signed; and the vessels were designed with future exports in mind. The Department has also confirmed that the target of an average build cost of £250 million per ship has been achieved.[176]

170. The recent announcement of a successful sale of the Type 31 design to Indonesia has been seen as further confirmation of the success of this approach. Babcock stressed to us that part of the selling point of the design is that it is price competitive, although we note that the export success of the Type 26 frigates has shown that a more expensive vessel can also be competitive in the export market, with potentially greater income for UK companies in the supply chain. Mr Waddell pointed out that one common feature of both vessels' export potential is that they benefit from being able to adapt to the customer's needs. Babcock have told us that one of the Type 31's main selling points is that it is designed for adaptability and to accommodate a range of mission capabilities. Mr Phillips and Mr Pyne told us that one of the selling points of the Type 26 is the potential for

173 Qq148–149

174 Government of Australia, "Naval Shipbuilding Plan", 2017, p105

175 Government of Australia, "Naval Shipbuilding Plan", 2017, p74; Government of Canada, "Canada's National Shipbuilding Strategy: 2019 Annual Report", 24 April 2021 p17; Qq164,175; Letter dated 25th October from the MinDP providing a copy of the requested Appendix to Sir John Parker's Review

176 Society of Maritime Industries (NAV0032); Philip Dunne (NAV0028); Confederation of Shipbuilding and Engineering Unions (NAV0031); Ministry of Defence (NAV0030); Q37; Letter dated 25th October from MinDP providing a copy of the requested Appendix to Sir John Parker's Review

modularity in its large mission bay and part of the reason Australia selected it was that it was a new design and could be adapted to the Royal Australian Navy's needs without significant design changes.[177]

The Government's Response

171. The Department has not fully embraced this advice, given by a range of independent experts. The DSIS promised an end to competition by default while the Minister for Defence Procurement told us that "social value is a very important element" of ship building.[178] However, the DSIS also stated that for shipbuilding "The procurement approach for each class will be determined on a case-by-case basis". Mr Waddell called this "a fundamental problem" and argued it reduces the industry's certainty about the MoD's plans.[179]

172. Sir John Parker told us that the Department had not consulted him as part of preparing the updated NSbS. However, as part of his 2019 review of NSbS implementation Sir John prepared an appendix, which is published for the first time as part of this inquiry. He noted that several of his recommendations from 2016 were still outstanding:[180]

- Government has not produced the recommended 30-year master plan for procurement (Recommendation 3): the Department has told us "Further detail on how government will set a clear demand signal to industry will be set out in the Refresh to the NSbS".
- Governance processes have not been simplified (Recommendation 5) although some trial projects have been initiated.
- Where Sir John Parker recommended industry and government establish a virtual shipbuilding industry model with the intention to build in block builds, the Department now says block build is an option bidders may offer if appropriate. Sir John's original assessment of progress against this recommendation has been redacted. It is also notable that Sir John believed UK industry should be competitive using the block build for the FSS contract (Recommendation 21), especially as requirements for only final integration in the UK demonstrate the potential for but not the intention or benefits of a block build approach.
- More priority must be placed on work to support the supply chain (Recommendation 28).
- Sir John Parker recommended the MoD work to understand the socio-economic benefit of giving work to UK shipyards (Recommendation 31). At the time of his review this had not been done but the MoD reports Government and industry are now working to collect and aggregate data. They also report that "Social Value weighting is now mandatory in all Government procurements".

177 "Babcock signs deal to sell AH140 frigate design licence to Indonesia" Naval Technology, 17 September 2021; Q42; Q149; Babcock (NAV0040); Qq61,83

178 Ministry of Defence, "Defence and Security Industrial Strategy", March 2021, p6; Q207

179 Ministry of Defence, "Defence and Security Industrial Strategy", March 2021, p92; Confederation of Shipbuilding and Engineering Unions (NAV0031), Q36

180 Q59; Letter dated 25th October from MinDP providing a copy of the requested Appendix to Sir John Parker's Review

Fleet Solid Support Ships

Box 3: Delays to the Fleet Solid Support Ship programme

The FSS programme is meant to find a replacement for the Fort Class support ships. The need for the ships and their potential role in a national shipbuilding strategy was identified in 2005. However, as a result of numerous delays and u-turns by successive governments, the competition to procure them is still ongoing and there are concerns that they will come in late and that they will either be built abroad or, if they are built in the UK, would strain the capacity of UK shipyards, which are also attempting to deliver the Type 26 and Type 31 frigates at the same time. This has turned what should have been the cornerstone of the fleet and the UK shipbuilding industry into a millstone around both their necks.

Timeline:

- 2005: Need for a new solid support ship identified along with potential for it to provide continuity of work after the aircraft carriers are completed.
- 2011: FSS programme delayed.
- September 2017: NSbS specifies that the contract to build the FSS will be open to international competition.
- May 2018: FSS competition begins for two ships with option for a third. It includes no requirement the vessels must be built in the UK—the Ministry of Defence blames EU procurement rules.
- November 2018: Four international firms and a British consortium selected to compete for the contract.
- November 2019: Competition stopped. The Ministry of Defence says the bids received are not fully compliant or delivering value for money.
- October 2020: Secretary of State announces that when the competition restarts the vessels will have to be built by "British-led" teams with a "significant" proportion of work done in the UK.
- May 2021: FSS competition relaunched for three vessels, with the requirement changed so that vessels must be integrated in the UK.
- September 2021: Contracts awarded to four consortia to develop designs and bids.

Source: Christopher Cope (NAV0007); Q40; Ministry of Defence, "National Shipbuilding Strategy: The Future of Naval Shipbuilding in the UK", 6 September 2017,p20; PQ 152792 on Fleet Solid Support Ships: Procurement, 19 June 2018; Ministry of Defence, "Shipbuilding firms chosen for Fleet Solid Support competition", 30 November 2018; "Fleet Solid Support Ships to be built by 'British-led' teams", Naval Technology, 21 October 2021; Ministry of Defence, "Fleet Solid Support ships competition launched", 21 May 2021; Ministry of Defence, "UK enters next stage of Fleet Solid Support competition", 1 September 2021

173. Witnesses point to the FSS competition as an example of how the Ministry of Defence is failing in large part to implement the NSbS and underlying recommendations properly. Mr Waddell told us that the competition should have been an important step in a reliable pipeline of work for British shipyards after the completion of the aircraft carriers, but instead it has been repeatedly cancelled and reopened, creating considerable uncertainty. These delays have led to concerns that the new vessels will not be delivered in time to replace RFA Fort Victoria, as noted earlier. The latest iteration of the competition began on 25 May 2021, and only requires final integration of the vessels in the UK. The Society for Maritime Industry told us:

> Despite claims to the country, it is our view that the MOD's approach to require just the integration of the ships in the UK does not fully support the intent of the National Shipbuilding Strategy.[181]

This calls into question the Ministry of Defence's claim in their written evidence that "The Fleet Solid Support ship programme aims to sustainably grow the industry, creating a third shipbuilding pipeline."[182]

174. Ministers have repeatedly claimed that the vessels will be built in UK shipyards and that only the design will be international. The Secretary of State told us:

> I'm confident … that there will be plenty of work, if not too much work in our British yards for a whole range of ships. I'm also confident that the future of the FSS will be predominantly in the United Kingdom.[183]

The Minister for Defence Procurement told us that integration in the UK "is not the limit of my ambition" and that:

> I am confident that the build will be substantially in the UK with all the integration work undertaken in the UK. I think that gets us the best of both worlds. We have an opportunity to see what is out there in terms of international design to ensure that we have the very best of kit to put the Royal Navy's way.[184]

However, he refused to confirm that the build will take place in the UK because of the ongoing competition.[185]

175. The Government's tepid approach to the Fleet Solid Support ships is highlighted by the marked contrast to the way it has thrown its weight behind the National Flagship programme. It has invoked a WTO national security exemption to restrict competition to UK build and pushed for construction to begin next year.[186]

176. ***The National Shipbuilding Strategy refresh must finally take on board the consistent recommendations given in successive reports by a range of experts. This includes providing a steady pipeline of work for British shipyards and working collaboratively with industry. The refresh should:***

- ***Ensure that warships are built in UK yards and that this designation continues to include the Fleet Solid Support ship contract, as well as the future replacements for the Tide and Wave class vessels.***
- ***Revisit the principles of the Parker Review and accept that active intervention is required by the government to modernise yards, guarantee an assured pipeline of work for UK yards and protect the skills base.***

181 Q40; Society of Maritime Industries (NAV0032)
182 Ministry of Defence (NAV0030)
183 Oral evidence taken on 23 June, HC (2021–22) 166, Q148
184 Qq179,207; We acknowledge that including international designs has so far worked well for the Type 31 competition as the Minister notes at Q203. However we note that the Type 31 programme was able to achieve this without including international competition for the build of the vessels.
185 Q180 The Minister repeated that "in the middle of a procurement process you are not going to draw me any further" at Q205
186 Qq209–214

- ***Prioritise designing vessels for export wherever possible, and consider incorporating adaptability into the design as a way to achieve this;***
- ***Give greater weight to social value and the needs of shipyards around the UK when considering competition;***
- ***Continue to follow the principles adopted after Sir John Parker's review, particularly showing agility, pace and grip in procurement, limiting modifications in contract signing and not delaying projects in response to annual budget pressures; and***
- ***Provide an assessment of the skills and professional engineering workforce the UK has and will need in its shipbuilding capability and explain how and on what timescales the Department will develop these.***

177. **We are not reassured by the Department's evasiveness around whether the Fleet Solid Support ships will be built in the UK.** ***The Department must ensure the Fleet Solid Support ship contract is built in a UK yard, reflecting its designation as a warship, whilst outlining the Department's ambition and confidence in UK delivery. In its response to this report, the Department should confirm how it will restrict the competition to a national build without further delaying the procurement process. It should also confirm whether the programme will follow the other recommendations in Sir John Parker's review, notably pace, grip and designing for export. As the Navy's only current solid support ship is scheduled to retire in 2028, the new vessels must be delivered as quickly as possible to ensure the Navy can deliver the sovereign core capability it aims for.***

Integrating technology

178. A common theme in the evidence we have received is the importance of integrating cutting edge technology to increase the effectiveness of the fleet. Evidence has particularly stressed the importance of sensors, communications, a digital backbone, uncrewed vessels and autonomy, and integration across UK forces and with allies.[187]

179. However, Airbus told us that the procurement process was overfocused on platforms and needed to "embed advanced digital technologies into the procurement process to ensure it is able to keep up with the UK's adversaries". They also emphasised that:

> Space is the great enabler of expeditionary sea power. All naval capabilities are reliant on space for their communications, situational awareness and positional and timing information, yet these dependencies are neither well understood nor fully considered in the design and procurement of future naval capabilities.[188]

180. Witnesses have expressed concerns that new technology gets stuck at the demonstrator phase. Rear Admiral Burton said:

> My worry at the moment is that the general public and Defence confuse a few innovative capabilities that have been seen in the press as something

187 Human Security Centre (NAV0025); Thales UK (NAV0018); Professor Geoffrey Till (Dudley Knox Chair of Naval History and Strategy at US Naval War College) (NAV0022)

188 Airbus (NAV0017); Q105

> that has been spread out across the force. Unless those capabilities are delivered across the force, the capability that the force as a whole delivers will not be there.[189]

The Society of Maritime Industries further warns: "industry has limited confidence that the RN has established a pathway to frontline deployment, and it is notable that DE&S [Defence Equipment & Support] is largely not engaged beyond delivery of the [Mine Hunting Capability] programme. Addressing this challenge is key if the RN is to reap the benefits of its bold technology strategy."[190]

181. Several witnesses have recommended changes to the procurement process to improve the adoption of new technology. Mr Dunne suggested:

> The coming refresh of National Shipbuilding Strategy should consider how to address allocating development stage funding into the Equipment Plan for programmes that have not yet passed the full suite of mature programme funding approvals. This should include reviewing the investment approval ceiling for the Chief Technology Officer in the Royal Navy responsible for driving innovation into service.[191]

Thales told us that the digital systems and sensors should be designed and ordered much earlier in the ship construction process to avoid suboptimal system designs and delays to the final ship construction timelines. Ms McBriar added in her oral evidence that these systems must then be "designed to be future-proofed and to be replaced and upgraded often". ADS called for the Navy to engage with industry early on in these projects, particularly on the Type 83 destroyer where design work must begin soon for delivery in the late 2030s.[192]

182. When we put these points to Vice Admiral Gardner he confirmed:

> I will be honest: I think we have historically been slow at bringing new technologies to the table. That is something that we are actively trying to address. We are doing it jointly with Navy Command through NavyX. On day one, when I took over as DG Ships, I set up an innovation and future capabilities team, because of that very problem. That team is actively working on that problem. More broadly, DE&S has just set up a future capabilities group. We absolutely recognise that we need to change the way we think about how we bring capability to the table, because we need to be much more agile and swifter than in the past.[193]

183. Admiral Radakin agreed that the Navy needed to change the way it procured technology and designed vessels to allow for more constant improvement:

> Can we start to accept that the correct way to build our ships is to have a lot more flexibility and introduce the technology almost as you are designing

189 Oral evidence taken on 13 April 2021, HC (2019–21) 1333, Qq98–99
190 Society of Maritime Industries (NAV0032)
191 Philip Dunne (NAV0028)
192 Thales UK (NAV0018); Q60; ADS (NAV0015), supported by BAE Systems plc (NAV0019)
193 Q286 NavyX is the Navy's new Autonomy and Lethality Accelerator. It develops, tests and trials new technologies that could have applications for the Navy. It is supposed to speed up the process of inventing new equipment and getting it into the field ("NavyX", The Royal Navy, accessed 30 November 2021).

> and building the ships, rather than something that was cemented in aspic 10 or 15 years ago? You then get the wrong capability too late, and it is not good enough in terms of what we need.[194]

184. **We welcome the Department's ambition to bring new technology into the fleet and the opportunities that the large number of planned vessels offer. It provides an early test of the new Integrated Operating Concept. It is essential that NavyX and Defence Equipment & Support (DE&S) improve their ability to take emerging technology beyond the demonstrator phase and deliver it to the field.** ***Digital systems should be prioritised more highly in procurement, with consideration given to them early in the design and build of new vessels. The Navy should plan as far as possible for them to be fitted flexibly into vessels and regularly upgraded to avoid capabilities becoming out of date. Development stage funding should be increased. We note the importance of space as an enabler for the Navy: the role it plays in delivering military capabilities will be considered as part of our dedicated space inquiry.***

Future Vessel Design

185. Several witnesses recommended that the Navy should consider exploring three future trends that are important to future vessel design: modularity, autonomy and distributed capabilities. These new technologies could transform the Royal Navy's vessels, although Sir John Parker emphasised that as the Navy and industry explore these new trends, they must ensure they have "the right people, the right technologies and the right engineers with the capability to risk-assess the impact of new technology and to plan for its orderly introduction in a way that will not disrupt the fundamentals of the operation."[195]

Modularity

186. Many witnesses suggested that the Navy should move to producing more modular ships in order to take advantage of developments in technology.[196] This would involve designing for physical and digital capabilities to be added and removed from a relatively simple hull as needed without extensive refits, while also enabling regular upgrading of the sensors, systems and counter measures that are key to defending against modern anti-ship weaponry (as noted in Chapter 2).[197] Witnesses noted that both the Type 31 and Type 26 "were designed to exploit modular offboard uncrewed solutions utilising flexible mission bays". Babcock, backed up by Sir John Parker, advised us that based on its experience with the Type 31 frigate modularity will also open up opportunities for export:

> Modularity of the build and the size of the vessels … allows us to incorporate capability modifications and additions beyond the UK's Type 31 requirement. This is well evidenced by the opportunities in Greece, Indonesia and Poland, all of which require substantially more capability than the UK Type 31 version but which we are able to offer due to the modularity and size of the platform.[198]

194 Q229
195 Q53
196 Confederation of Shipbuilding and Engineering Unions (NAV0031); Society of Maritime Industries (NAV0032); Babcock (NAV0040); Lockheed Martin UK (NAV0011); Professor Trevor Taylor (Director, Defence, Industries & Society Programme at RUSI) (NAV0013); James London (NAV0021); Ms McBriar (Q62); Sir John Parker (Q41)
197 Thales UK (NAV0018)
198 Babcock (NAV0040); Q41

187. The Navy's recently announced "Persistent Operational Deployment Systems" are a major step towards the latter. These will be vessels like shipping containers that house existing and emerging capabilities which can be fitted to vessels interchangeably. According to reports, "These may include an autonomous boat for surveillance and reconnaissance, quadcopter drones to deliver supplies, humanitarian aid and disaster relief stores or medical equipment. Versatile in their approach, they have the capacity to become an additional medical room for service personnel at sea or a control centre for Royal Marines' operations." The earliest examples are expected to contain automated mine hunting systems and other drones.[199]

Autonomous Vessels

188. It was widely accepted in evidence that autonomous vessels provide an opportunity for additional capability and that the Navy is likely to use them increasingly often.[200] We have been advised that vessels should be designed to properly exploit autonomous systems; for example, by designing space into the hulls for vessels to act as motherships to smaller autonomous vessels.[201]

189. Several witnesses argued that autonomous vessels should be used to supplement, not to replace, existing vessels and crew—not least because they may not be able to contribute to deterrence in the same way. Professor Caverley suggested that the Navy should plan to have uncrewed sensors and effectors on vessels, rather than autonomous vessels operating alone, since: "I don't know how an unmanned system does presence. We don't know what happens when you put an unmanned system at sea and leave it alone, and whether someone will pick it up and play with it or whether it has the same deterrent effect." He also noted that "Just because you are unmanned does not mean you will save a lot on personnel", as a trained crew will always be required to maintain autonomous platforms.[202]

Distributed Capabilities

190. Some witnesses believed that in order to take advantage of new technology properly the Navy may need to change its focus from platforms to systems of capabilities.[203] They advised that the Navy explore concepts like distributed lethality and distributed operations under which sensors, decision makers and offensive strike capabilities would be spread across a mix of crewed and uncrewed vessels, which would coordinate to deliver a strike on adversaries, rather than all being deployed on one vessel.

199 Ministry of Defence, "Royal Navy outlines future vision", 12 September 2021

200 Human Security Centre (NAV0025); Thales UK (NAV0018); Gabriele Molinelli (NAV0002)

201 Gabriele Molinelli (NAV0002); Society of Maritime Industries (NAV0032)

202 Qq1,24; Human Security Centre (NAV0025) also agreed that the adoption of uncrewed systems must not be used to obscure cuts to vessel numbers.

203 Airbus (NAV0017); Professor Geoffrey Till (Dudley Knox Chair of Naval History and Strategy at US Naval War College) (NAV0022); Lockheed Martin UK (NAV0011)

Box 4: Definition of distributed lethality and distributed operations

Distributed Lethality: "The notion that every platform, even if detached from its intended specialist role in task-group operations, must still be sufficiently capable to complicate an adversary's thinking"

Distributed Maritime Operations: "A more distributed fleet architecture. Rather than concentrating on a limited number of large ships or grouping of vessels, manned and unmanned assets will be deployed over multiple locations and large distances, and networked to allow synchronised operations. The aim is to enhance situational awareness, and the range of effects that can be employed. It will challenge the ability of adversaries to target assets."

Source: Dr David Blagden (Senior Lecturer in International Security at University of Exeter) (NAV0020); Lockheed Martin UK (NAV0011)

191. Moving to distributed operations would have implications for procurement, with the Navy focused on procuring capabilities rather than individual vessels. As an example, instead of a like for like replacement of Type 45 with Type 83 destroyers to perform an air defence function, the Navy might develop a system of sensors and autonomous vessels with some Type 83s acting as motherships.

192. These principles are being explored by the US and although witnesses believed that the Navy may not have sufficient mass to copy the US Navy's approach, they also suggested that the UK will need to remain compatible with the US's approach. The Navy might benefit from being a "fast follower" taking on board lessons from the US's experience.[204]

The Type 32: the First Future Ship

193. The Navy is planning to introduce five Type 32 frigates, which would increase the escort fleet (frigates and destroyers) from 19 to 24. These vessels may offer a test case for the design principles witnesses have suggested.

194. The Department has told us that plans for the Type 32 are still being developed. Admiral Radakin described the Navy's current thinking on the project, confirming that the vessel will be a general-purpose frigate whose purpose would be to increase the overall number of vessels in the fleet, rather than fill a specific capability gap. He reported that the Navy is currently debating whether to deliver a batch 2 Type 31 or a ship with significantly more automation and opportunity to add new technology, including uncrewed vehicles and directed energy weapons, as it develops rather than fixing it in the design phase. He promised that "This will be a platform which will be able to host, ideally, a different set of capabilities that we can swap in and out, but will be much more modern and lethal in terms of what it can deliver." We note that the objective of the Type 32 frigate remains vague.[205]

204 Q20; Professor Geoffrey Till (Dudley Knox Chair of Naval History and Strategy at US Naval War College) (NAV0022)

205 Qq227–231

195. Professor Till recommended that the Navy consider acquiring vessels like a corvette or light frigate[206] equipped with heavy weaponry, noting the effectiveness of the Israeli Sa'ar 5 and 6 and Russian Stereguschiy, Gremyashchiy, Buyan and Krakurt classes: the Type 32 programme would provide an opportunity to do this. He listed some of their advantages:[207]

- Greater numbers of smaller, speedier ships provide tactical agility, increasing the adversary's detection problems and if sufficiently well armed can offer multiple axes of attack, in keeping with the concept of Distributed Maritime Operations.
- They can provide a means of responding to attacks by a high volume of small, fast-moving, sometimes remotely operated vessels equipped with weapons such as anti-tank missiles and grenade launchers, or packed with explosives intended for a collision.[208] Attacks like these have been used by pirates and there are reports that Iran may be planning to take this approach in future confrontations.
- They offer more options in responding to enemies using civilian or paramilitary boats, as seen by China in the South China Sea or Iceland in the Cod Wars.
- They may be more readily available for operations with local partners to build support.
- They are easier to deploy forward for long periods of time.
- They offer naval officers more opportunities for command.

196. The heavy weaponry could potentially include a land attack missile. Dr Kaushal notes the installation of the 2500km Kalibr 3M-14 land attack missiles on Russian corvettes means that "the Russian navy can strike critical infrastructure at reach without venturing far from its ports. The Caspian Sea fleet demonstrated this during the 2015 Syrian campaign in which it conducted cruise missile strikes."[209]

197. Admiral Radakin confirmed that this model of ship "would be part of the option set" but added that the Navy was trying to avoid "over-engineering and deciding too early".[210]

198. **The Navy is moving towards principles of modularity, autonomy and lethality in vessel design. Modularity is likely to increase vessels' capabilities and the potential roles they can play. In the future vessels may perform their roles supported by**

206 A corvette can be defined in very simple terms as the type of vessel between a frigate and a patrol vessel. We note that there is no formal definition of corvettes, frigates and similar classes of vessels, and that there has previously been debate over whether the Type 31 should be classified as a corvette (adequately summarised in "Should the Type 31e frigate be reclassified as a corvette", Navy Lookout, January 18, 2018) We do not take a view on whether the Type 31 or Type 32 would be better classed as frigates or corvettes. We note that the Type 31's planned crew of 80–100 would put it within the definition used by some sources of a Corvette ("What is a Corvette? And What Next", Centre for International Maritime Security, 25 November, 2013). However, we also note that it is expected to have a range of around 9,000 nautical miles, which is significantly greater that the around 4,000 nautical miles maximum range of Russian and Israeli corvettes; if the Navy plans to use the Type 32 for presence operations in regions like the Indo-Pacific along with the Type 31 this would argue that both vessels require the longer range.

207 Professor Geoffrey Till (Dudley Knox Chair of Naval History and Strategy at US Naval War College) (NAV0022) He was supported by James London (NAV0021)

208 "Swarm attack: taking on piracy's deadliest tactic", Naval Technology, 22 December 2020

209 Dr Sidharth Kaushal (NAV0037)

210 Q231

autonomous vessels to which they can act as motherships. ***The Navy should consider taking a distributed lethality approach to future fleet and vessel design, learning from the US Navy's development of the concept.***

199. **The Type 32 frigate programme presents an opportunity to start thinking about how to design vessels for the future.** ***We support the Navy's proposal for a programme that delivers a less exquisite vessel and increases hull numbers for presence operations in relatively permissive environments and lower-level conflict. We strongly recommend that the Navy look carefully at the possibility of emulating other navies' successes with heavily armed light frigates/corvettes, and consider delivering a similar vessel that will be fitted with an effective missile capability from the start. This should be included in any consideration of using common missile silos across vessel classes.***

5 Conclusion

200. In this increasingly insecure security environment, there is a danger the Navy will not be able to cope. The Navy's capabilities are stretched thin between its current missions: additional tasks or an unexpected crisis could break it. From now until at least 2027, it must take on increased responsibilities in a deteriorating international security environment, relying on a mix of elderly vessels that are often unavailable and new and untested assets and processes, with a tight budget for operations and maintenance. The Government has impressive ambitions for it after it passes this period of risk, but it can only do so if it succeeds in delivering several highly complicated new platforms and managing the transitions as they come into service.

201. The Department must help the Navy mitigate these risks by:

- ensuring it is being honest with other government departments, international partners and the public with regards to whether the Royal Navy is capable of a meaningful presence in the Indo-Pacific, whilst fulfilling existing obligations to NATO and European partners;
- collaborating with the UK shipbuilding sector by providing an assured pipeline of work and actively intervening to support the modernisation of yards, which will support the delivery of new vessels;
- addressing issues with availability and maintenance;
- doing more at the political level to ensure allies will deliver the capabilities the Navy is relying on; and
- being honest about both the strengths and weaknesses of our fleet and strategy.

Parliament will support this with enhanced scrutiny of key programmes, the transition process and progress towards growing the fleet, and management of availability issues.

Conclusions and recommendations

The Royal Navy's Role

1. Over the next decade the UK and the Navy will face an increasingly complex international security environment. Russia and China will remain the primary adversaries at sea, with the relative importance of the UK's response to each likely to shift and potentially interact through the decade. Developments in technology, particularly in hypersonic weapons, are changing the conduct of naval warfare and grey zone operations are becoming increasingly important for the UK's security in the maritime domain, as they are in others. (Paragraph 16)

2. The Government has ambitious plans for the Royal Navy. The Integrated Review has given the Navy a significantly increased, and potentially the leading, role in the UK's security posture. It is likely to be the Government's tool of choice to deliver its strategy of persistent engagement and competition below the threshold of warfare. As a result, the Navy must be able to deliver constabulary and presence operations for peace time maritime security, while still able to perform high-end warfighting functions effectively, including upholding NATO taskings and other international agreements. (Paragraph 45)

3. The Navy cannot fulfil the full ambition of the Integrated Review with its current fleet. It needs more lower-end, adaptable vessels, like the planned Type 31 frigate, to fulfil the presence operations planned. A large part of the Government's plan to address this relies on increasing availability, as well as through the Type 32 programme. We are not convinced that increased availability can produce enough vessels to be relied upon in an emergency. *If the Navy intends to deliver all missions, especially the presence the IR specifies, growth of major surface combatants needs to double, with growth from small, adaptable vessels. The resource budget, personnel and the number of auxiliary vessels should grow commensurately. This expansion will require a significant increase in funding.* (Paragraph 46)

4. *The Ministry of Defence should be honest with the public about the deteriorating international security situation, the capabilities the Navy will need to protect Britain in this environment, and the funding required to deliver those capabilities. We believe that if the public understands the Navy's requirements, they will support the increase in funding necessary to deliver it.* (Paragraph 47)

5. The Indo-Pacific tilt is a significant change in the UK's defence posture which will increase the demand and risk placed on finite resources. We will consider the value and effectiveness of the overall tilt policy and greater engagement in the region in future inquiries. Under current plans the naval assets assigned to the Indo-Pacific are only sufficient for the current very limited presence operations in a stable security environment. It is unlikely that they will be able to complete more challenging missions, and may even find themselves in danger, if the UK is drawn more deeply into the region and forced to commit more forces to defend UK interests, or if the local security situation deteriorates. As a result, the increased commitment to the region must be regarded as one of the many risks the Royal Navy faces in a bumpy decade. *The Government must be honest with the public with regards to the cost of*

the Indo-Pacific tilt. The Department should confirm in its response how regular future carrier strike group deployments will be, and whether they will have the same fleet composition, missions and support from allies as the 2021 carrier strike group deployment. (Paragraph 48)

The Current Fleet

6. The Royal Navy should be proud of its position as one of the leading global navies and its ability to deliver and operate two aircraft carriers. The carrier strike group deployment has shown that, when working with allies, the Navy can deliver a task group able to meet the goals of establishing presence, building relationships with partners and supporting trade. The servicemen and women and civilian staff who worked hard to deliver the deployment should be proud of their achievement. We note that the loss of the F-35 plane, which is still being managed as we write this report, is a significant incident, and we are thankful for the safe recovery of the pilot. (Paragraph 55)

7. *The Department should provide further explanation of what Carrier Enabled Power Projection (CEPP) is intended to deliver. This should include consideration of what innovative capabilities the carriers can provide beyond carrier strike, littoral manoeuvre and humanitarian assistance, and more information on what role the F-35 will play in delivering an offensive air capability after any improvements to its armaments. It should be set out in advance of the aircraft carriers' next deployment in a published strategy, with a classified annex if necessary.* (Paragraph 60)

8. In light of the Department's own target that the UK's CEPP capability will reach Full Operating Capacity in 2026, 2025 is too long to wait to know the size of the planned F-35 fleet and how it could be used. *The Department must provide clarity on how it intends to operate the F-35 fleet before then. It must specifically address the questions of how many carriers and F-35s will be operated by the Navy and the RAF as part of routine operations and how a surge capacity will be delivered if one is planned. The Department should also be clear about what role uncrewed aircraft will play and when and how that role can be delivered. Until the Department provides clarity on all these points it is impossible for them or us to be reasonably sure of the risks the programme is carrying and how they can be mitigated.* (Paragraph 65)

9. It is clear that the budget priorities of successive governments have delivered a fleet of porcupines (well defended herbivores). We welcome the promises from the Department that future vessels will carry the offensive missiles they need and in particular that this will restore a land attack capability to the fleet. *The Department must deliver the funding to swiftly end the spectacle of space on highly capable vessels being used to carry nothing but air. This should include consideration of both the threats and the opportunities posed by hypersonic missiles as well as the potential to use common missile silos across classes and to deliver compatibility with different international partners. The Department should confirm in its response that it still intends the FC/ASW to be compatible with the Mark 41 vertical launch system. The Department should also be mindful of previous warnings that procuring a 'bridging' system with long post-2030 life expectancy could damage the relationship with France.* (Paragraph 73)

10. The delivery of digital and data integration like the Naval Strike Network will be absolutely crucial if the fleet is to be operated effectively. *The Department must ensure that the Naval Strike Network is fully funded and compatible with Defence's digital backbone*. (Paragraph 79)

11. Evidence continues to show that sacrificing the Royal Navy's amphibious capability would be, in the words of our predecessor Committee, "a short-sighted, militarily illiterate manoeuvre totally at odds with strategic reality." Against this background we are concerned that the Future Commando Force and the Littoral Response Groups are not properly resourced to continue amphibious operations. *The Department must confirm that it remains committed to retaining the Royal Marines' amphibious capabilities*. (Paragraph 86)

12. The underwater domain will become an ever more important part of naval warfare in the future. *The Department should explore increasing the size of the attack submarine fleet as part of the Astute successor programme, Submersible Ship Nuclear Replacement (SSNR). At the very least it must confirm in its response that it will not decrease the number of attack submarines in the fleet below the seven Astute class submarines it plans to operate. The Department must also consider whether the SSNR submarine design will include a horizontal launch missile system in line with current UK submarines, or a vertical launch system for systems such as Tomahawk, in line with some of the more modern US Navy submarines. The Department should confirm in its response how it will ensure that current UK attack submarines retain their land attack missile capability, given the US Navy's transition to vertical launch systems*. (Paragraph 92)

13. We are very concerned that the limited resource budget allocated under the Spending Review for the remainder of this Parliament will be insufficient to properly operate and maintain the full fleet. We were not convinced by the Department's assertion that "the resource budget is adequate to ensure that we maintain the crewing and effectiveness of those additional resources". If this is not remedied, there will almost certainly have to be a compensating reduction in maintenance of or operations by the aircraft carriers or other vessels. If the Navy attempts to cut the payroll costs element of RDEL by reducing personnel numbers, this could make it even harder to bring in the new classes of vessels in the 2030s as planned. *Defence spending must increase to allow the Navy's resource budget to beat inflation and to accommodate any new cost model for the aircraft carriers*. (Paragraph 96)

14. The Navy plans to rely on allies to provide capabilities in almost all military operations and for most major missions working with allies will not be optional. Overall, this way of working is a source of strength for the Navy. However, we do need an honest assessment of the way in which we will integrate in the systems of allies. *The Department must do more at the political level to ensure the Navy can rely on this support when needed, including arranging regular exercises with other navies, and engaging the expanded defence liaison network promised by the DCP. The Department must be clear how far it intends to privilege interchangeability with the US over interoperability with other partners and what the trade-offs involved are. It must also be honest about the realistic limits on its ability to act alone*. (Paragraph 105)

15. Building interoperability with nations in the Indo-Pacific will be vital for delivering any tilt to the region. This must include coordinating with European partners and working to rebuild the military relationship with France. *The Navy must continue to regularly exercise with partners in the region after the conclusion of CSG21, which will help to deter adversaries and demonstrate that the UK's commitment to the region goes beyond rhetoric. This should include regular exercises with European and NATO partners, including consideration of developing a programme of exercises under AUKUS. The Department should develop a strategy for how it will collaborate with both regional partners and NATO allies in the Pacific within the next year. The Department should confirm in its response whether the Royal Navy will continue to contribute to Op ATALANTA*. (Paragraph 111)

16. We support the Navy's plans to retain a sovereign core capability but are concerned that it cannot currently deliver all the elements required to defend and support the task group. *As a result, the Department must take early action on the availability of attack submarines and destroyers, and the lack of Fleet Solid Support shipping. If action is not taken to address this within the next year, we will begin to request updates on progress twice a year. The Department should explore whether there is an option of upgrading the Type 45 destroyer to deliver ballistic missile defence and what the costs and timelines involved are and provide us with updates on the exploratory work*. (Paragraph 116)

17. We welcome the Secretary of State's focus on improving vessel availability as it is crucial for the effective operation of the fleet. We recognise that the Navy has already taken measures to address it but are concerned that any improvements come from increased use of low-end warships, rather than improvements in the availability of Type 23 frigates and Type 45 destroyers. The availability of these vessels will be particularly important in the next decade to ensure the Navy's ambitious plans for the fleet can be delivered without capability gaps. However, availability issues are unlikely to improve significantly, and could potentially deteriorate further, until new frigates are introduced, and the Type 45 Power Improvement Project (PIP) is complete. *It is only prudent for the Navy, when it is setting strategic and operational goals over the period, to take a more realistically pessimistic view of UK capabilities than is currently the case*. (Paragraph 126)

18. *Reporting of availability must improve to avoid concealing issues with the availability of specific classes of vessel. The Ministry of Defence should report annually to Parliament in a written statement on the availability of all surface vessels in the Royal Navy and Royal Fleet Auxiliary by class. The answer to PQ 36545 on Type 23 Frigates, dated 26 July 2021, provides a model and demonstrates that the publication of data at this level of specificity does not compromise security. The Ministry of Defence should also make a classified report to this Committee including details of any times in the previous year when surface vessels were unexpectedly unavailable for more than a month and a list of surface vessels that are expected to enter a refit or maintenance for a year or more, or which are being mothballed, during the course of the following year*. (Paragraph 127)

19. The low availability of the UK's Type 45 destroyers and recognised issues in their propulsion systems are a major cause for concern. The destroyers cannot do their job or effectively deter adversaries if only half, and sometimes only one, of the six

ships is available for operations at any time. The PIP that is intended to improve this situation is scheduled for completion in 2028 but there are indications that timelines may be slipping. We find it extraordinary that the Navy is prepared to wait seven years to fully repair these £1 billion destroyers, which are arguably the most powerful units in the surface fleet after the aircraft carriers. (Paragraph 128)

20. *The Ministry of Defence should investigate claims that each PIP upgrade could be delivered in less than twelve months and confirm in its response what if any barriers there are to speeding up the programme. The response should also confirm whether an SRO has been appointed for the PIP. If not, one should be appointed and they should be prepared to provide the Committee with an annual report on the programme within six months of appointment, and then annually. If necessary, we will expect the SRO to answer additional questions on their programmes in a public evidence session.* (Paragraph 129)

21. The Astute class represent arguably the best attack submarine in the world, but they cannot effectively deter anyone until they are actually in service; therefore we cannot afford any further delay in the delivery of the remaining Astute boats. We are concerned by reports that submarine availability is weak, and not reassured by learning that the US and Australian submarine fleets are no better. Reported issues with the availability of the Vanguard class submarines that deliver the nuclear deterrent mean that the Dreadnought successor programme must be brought in on schedule, as further life extensions cannot be relied upon to fill in any gaps. *The Ministry of Defence should set out in its response appropriate arrangements it will use to ensure that we are briefed on submarine availability once a year, with due regard to both security and the importance of scrutiny to ensure effective delivery.* (Paragraph 132)

Shipbuilding and the Future Fleet

22. The next decade is one of significant risk for the Royal Navy's fleet. During a period when it is being expected to take on increased responsibilities in a deteriorating international security environment, the Navy will be relying on a mix of elderly vessels (like the Type 23 frigates) and new and untested assets and processes (like the uncrewed mine countermeasures), while also being constrained by a tight budget for operations and maintenance that will force it to change how it operates. In addition, crucial programmes like the Crowsnest early warning system, the Type 45 Power Improvement Project and introduction of the Naval Strike Network will not be completed for several years, all of which incurs risk. The Navy will also be forced to carry capability gaps in medical facilities and anti-ship missiles, because of the retirement of RFA Argus and Harpoon, and likely also in its ability to monitor critical national infrastructure and deliver support shipping and logistics, because of the uncertain in-service date of the Multi-Role Ocean Surveillance Ship and delays to the Fleet Solid Support ship programme. The lack of Fleet Solid Support ships is a particular concern because it threatens the Navy's ability to deliver a force with a sovereign core that can act independently of allies. (Paragraph 144)

23. Towards the end of this decade the Navy intends to bring in several completely new classes of vessels simultaneously. These plans must be delivered on schedule if the

Navy is to avoid capability gaps and end the period of risk it has created through its own planning and procurement decisions. We welcome indications that these programmes are currently on target. However, past performance is not encouraging, and numerous risks have been identified. The security of the fleet and the UK rely on these projects being delivered on time. Given the challenges associated with the age of the vessels, like the provision of spare parts, we are far from confident that any delays can be effectively managed by extending the life of ageing vessels without additional risk. (Paragraph 152)

24. Proper scrutiny is essential to ensure programmes are delivered on time. *In order to allow for proper scrutiny of ongoing programmes, the Ministry of Defence should emulate the US Department of Defense and provide Parliament with an annual shipbuilding plan, including the number of ships planned to enter and leave service each year in the next 30 years. We ask that the Senior Responsible Owners for the Type 26, Type 31, Astute and Dreadnought programmes provide the Committee with an annual report on each of their programmes within six months of the publication of this report, and then annually. If necessary, we will expect the SROs to answer additional questions on their programmes in a public evidence session.* (Paragraph 156)

25. *The National Shipbuilding Strategy refresh must finally take on board the consistent recommendations given in successive reports by a range of experts. This includes providing a steady pipeline of work for British shipyards and working collaboratively with industry. The refresh should:*

    - *Ensure that warships are built in UK yards and that this designation continues to include the Fleet Solid Support ship contract, as well as the future replacements for the Tide and Wave class vessels.*
    - *Revisit the principles of the Parker Review and accept that active intervention is required by the government to modernise yards, guarantee an assured pipeline of work for UK yards and protect the skills base.*
    - *Prioritise designing vessels for export wherever possible, and consider incorporating adaptability into the design as a way to achieve this;*
    - *Give greater weight to social value and the needs of shipyards around the UK when considering competition;*
    - *Continue to follow the principles adopted after Sir John Parker's review, particularly showing agility, pace and grip in procurement, limiting modifications in contract signing and not delaying projects in response to annual budget pressures; and*
    - *Provide an assessment of the skills and professional engineering workforce the UK has and will need in its shipbuilding capability and explain how and on what timescales the Department will develop these.* (Paragraph 176)

26. We are not reassured by the Department's evasiveness around whether the Fleet Solid Support ships will be built in the UK. *The Department must ensure the Fleet Solid Support ship contract is built in a UK yard, reflecting its designation as a warship, whilst outlining the Department's ambition and confidence in UK delivery. In its response to this report, the Department should confirm how it will restrict the*

competition to a national build without further delaying the procurement process. It should also confirm whether the programme will follow the other recommendations in Sir John Parker's review, notably pace, grip and designing for export. As the Navy's only current solid support ship is scheduled to retire in 2028, the new vessels must be delivered as quickly as possible to ensure the Navy can deliver the sovereign core capability it aims for. (Paragraph 177)

27. We welcome the Department's ambition to bring new technology into the fleet and the opportunities that the large number of planned vessels offer. It provides an early test of the new Integrated Operating Concept. It is essential that NavyX and Defence Equipment & Support (DE&S) improve their ability to take emerging technology beyond the demonstrator phase and deliver it to the field. *Digital systems should be prioritised more highly in procurement, with consideration given to them early in the design and build of new vessels. The Navy should plan as far as possible for them to be fitted flexibly into vessels and regularly upgraded to avoid capabilities becoming out of date. Development stage funding should be increased. We note the importance of space as an enabler for the Navy: the role it plays in delivering military capabilities will be considered as part of our dedicated space inquiry.* (Paragraph 184)

28. The Navy is moving towards principles of modularity, autonomy and lethality in vessel design. Modularity is likely to increase vessels' capabilities and the potential roles they can play. In the future vessels may perform their roles supported by autonomous vessels to which they can act as motherships. *The Navy should consider taking a distributed lethality approach to future fleet and vessel design, learning from the US Navy's development of the concept.* (Paragraph 198)

29. The Type 32 frigate programme presents an opportunity to start thinking about how to design vessels for the future. *We support the Navy's proposal for a programme that delivers a less exquisite vessel and increases hull numbers for presence operations in relatively permissive environments and lower-level conflict. We strongly recommend that the Navy look carefully at the possibility of emulating other navies' successes with heavily armed light frigates/corvettes, and consider delivering a similar vessel that will be fitted with an effective missile capability from the start. This should be included in any consideration of using common missile silos across vessel classes.* (Paragraph 199)

Comparison of national fleets

Table 5: Comparison of UK, Allies and Adversaries' Fleets

			United Kingdom	United States	France	Rest of NATO	China	Russia	India	Japan
Submarines	Strategic	Nuclear Powered Ballistic Missile Submarine (SSBN)	4	14	4	0	6	11	1	0
		Ballistic Missile Submarine (SSB)	0	0	0	0	1	0	0	0
	Tactical	Nuclear Powered Attack Submarine with dedicated launch tubes for Guided Missiles (SSGN)	0	51	0	0	0	8	0	0
		Nuclear Power Attack Submarine (SSN)	6	3	4	0	6	10	1	0
		Attack Submarine (SSK)	0	0	0	58	46	20	14	22

			United Kingdom	United States	France	Rest of NATO	China	Russia	India	Japan
Principal Surface Combatants	Aircraft Carriers	Nuclear Powered Aircraft Carrier (CVN)	0	11	1	0	0	0	0	0
		Aircraft Carrier (CV/CVH)	2	0	0	0	2	1	1	4
		VSTOL Aircraft Carrier (CVS)	0	0	0	2	0	0	0	0
	Cruisers		0	24	0	0	3	4	0	3
	Destroyers		6	68	2	19	36	11	10	38
	Frigates		12	21	18	90	46	16	17	6
Patrol Combatants	Corvettes		0	0	6	23	72	42	8	0
	Patrol Ships		8	0	4	56	87	3	10	0
Amphibious Vessels	Principal Amphibious Ships	Amphibious Assault Ship (LHD)	0	7	3	4	1	0	0	3
		Assault Landing Ship (LHA)	0	2	0	0	0	0	0	0
		Landing Platform Helicopter (LPH)	0	0	0	0	0	0	0	0
		Landing Platform Dock/Landing Ship Dock (LPD/LSD)	5	22	0	4	7	0	1	0

			United Kingdom	United States	France	Rest of NATO	China	Russia	India	Japan
Mine Warfare	Mine Countermeasures	Mine Countermeasures Command and Support Ship (MCCS)	0	0	0	3	0	0	0	4
		Oceangoing Mine Countermeasures Vessel (MCO)	6	8	0	13	19	0	0	0
		Oceangoing Minesweeper (MSO)	0	0	0	5	0	8	0	2
		Oceangoing Minehunter/ Coastal Minehunter (MHO/MHC)	5	0	13	80	10	2	0	0

			United Kingdom	United States	France	Rest of NATO	China	Russia	India	Japan
Auxiliaries	Logistics and Supply	Fast Combat Support Ship (AOE)	0	2	0	0	0	0	0	5
		Fleet Replenishment Oiler with a Hanger (AOEH)	4	0	0	0	2	0	0	0
		Fleet Replenishment Oiler with RAS Capability (AOR)	0	15	0	5	0	4	1	0
		Fleet Replenishment Oiler with a Hanger (AORH)	3	0	2	9	10	0	3	0

Source: Defence and Military Analysis Programme (DMAP), International Institute for Strategic Studies

Table 6: The Royal Navy's Fleet in November 2021

Category	Type	Class	Number in fleet	Royal Navy's description of purpose
Principal Surface Combatant	Aircraft Carrier	Queen Elizabeth	2	Provide a maritime power projection capability for fixed-wing carrier strike, rotary wing strike and littoral manoeuvre operations.
	Destroyer	Type 45	6	Multi-purpose combatants with a focus on anti-air warfare, but with capabilities in many disciplines, including the ability to provide fire support and air defence to forces ashore. Able to deploy autonomously and fulfil all maritime roles, especially providing a presence.
	Frigate	Type 23	12	As above but with a focus on anti-submarine warfare rather than anti-air.
Submarines	Nuclear powered ballistic missile submarine (SSBN)	Vanguard	4	Provide nuclear deterrence with at least one continually on deterrent patrol.
	Nuclear Powered attack submarine (SSN)	Astute	4	Provide principal sea denial capability against both ships and other submarines. Can also deliver power projection on land with Tomahawk missile, covertly gather intelligence and insert and recover special forces.
		Trafalgar	2	
Patrol Vessels	Patrol Ships (Patrol Combatants)	River II Class Patrol Ship	5	Maritime security operations and constabulary tasks, to protect sovereignty, economic interests and ensure good order and security of the maritime environment. Batch 1 primarily patrol UK and Overseas Territories, while Batch 2 have been deployed to non-UK waters.
		River Class Patrol Ship	3	
	Fast Patrol Boat	Scimitar	2	Operate in ports and confined waters to deliver maritime security, force protection and training for future officers.
		Gibraltar Patrol Boat	1 in trials (2nd due 2022–3)	
		Archer	16	
	Ice Patrol Ship	Protector	1	Annual deployments to Antarctic waters to uphold treaty commitments, exercise sovereignty, assist British Antarctic Survey and conduct hydrographic survey and meteorology.

Category	Type	Class	Number in fleet	Royal Navy's description of purpose
Amphibious Vessels	Landing Platform Dock (LPD)	Albion	2	Provide the littoral manoeuvre capability that enables the maritime power projection of a land force as part of an amphibious task group.
	Landing Ship Dock (LSD)	Bay	3	
Mine Warfare	Mine Countermeasures Vessel	Hunt	6	Maintain the flow of commercial and naval shipping in harbours and choke points and ensure access to open oceans for nuclear deterrent and task groups.
		Sandown	5	
Royal Fleet Auxiliary—Logistics and Supply	Fleet Replenishment Oiler	Fort	1	Sustain Navy vessels with fuel, food, stores and ordnance that can be transferred at sea to enable persistence. Can also embark helicopters and significant elements of a landing force and undertake activities such as anti-piracy and disaster relief in their own right.
		Wave	2	
		Tide	4	
	Casualty Receiving Ship	HMS Argus	1	Medical care and aviation training
Survey Vessels	Ocean Survey Ship	HMS Scott	1	Provide a specialist military data gathering capability that is used to inform campaign planning and situational awareness. The information they gather is required for theatre entry and littoral manoeuvre. Vessels require support if they are operating in areas with a threat.
	Survey Ship	Echo	2	
	Coastal Survey Ship	HMS Magpie	1	
Royal Marines Vessels	Landing Craft	LCU Mk10	9	Can deploy globally without host nation support and project from the sea to conduct operations, ranging from raids to full assault as the spearhead of littoral manoeuvre operations, inland.
		LCVP MK5B	8	
	Inshore Raiding Craft	IRC Mk3	50	
	Offshore Raiding Craft	Troop Carrying Variant	27	
		Fire Support Variant	8	

Source: Royal Navy Fleet Poster; Ministry of Defence "Joint Doctrine Publication 0–10: UK Maritime Power", October 2017, pp54–57; Royal Navy Website (Named vessels are only one of their class)

Formal minutes

Tuesday 7 December 2021

Physical meeting

Members present

Tobias Ellwood, in the Chair

Stuart Anderson

Sarah Atherton

Martin Docherty-Hughes

Richard Drax

Mark Francois

Kevan Jones

John Spellar

"We're going to need a bigger Navy"

Draft Report ("*We're going to need a bigger Navy*"), proposed by the Chair, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 201 read and agreed to.

Summary agreed to.

A Paper was appended to the Report as Appendix 1.

Resolved, That the Report be the Third Report of the Committee to the House.

Ordered, That the Chair make the Report to the House.

Ordered, That embargoed copies of the Report be made available (Standing Order No. 134).

Adjournment

Adjourned till Tuesday 14 December 2021 at 2.00pm.

Witnesses

The following witnesses gave evidence. Transcripts can be viewed on the inquiry publications page of the Committee's website.

Tuesday 8 June 2021

Admiral Sir Philip Jones, First Sea Lord (2016–2019); **Professor Jonathan Caverley,** Professor of Strategy, US Naval War College — Q1–35

Tuesday 29 June 2021

Sir John Parker GBE FREng; **Ian Waddell**, General Secretary, Confederation of Shipbuilding and Engineering Unions — Q36–59

David Lockwood CBE, CEO, Babcock International Group; **Glynn Phillips**, Group Managing Director Maritime and Land UK, BAE Systems; **Sam McBriar**, Director of Strategic Marketing for Maritime, Thales UK — Q60–107

Tuesday 21 September 2021

Christopher Pyne, Former Australian Minister of Defence; **Professor Tetsuo Kotani**, Professor, Meikai University, Senior Fellow, The Japan Institute of International Affairs — Q108–152

Tuesday 2 November 2021

Jeremy Quin MP, Minister for Defence Procurement, Ministry of Defence; **Vice Admiral Chris Gardner**, Director General, Ships Domain, DE&S, Ministry of Defence; **Admiral Tony Radakin**, First Sea Lord, Ministry of Defence — Q153–319

Published written evidence

The following written evidence was received and can be viewed on the inquiry publications page of the Committee's website.

NAV numbers are generated by the evidence processing system and so may not be complete.

1 ADS (NAV0015)

2 Abdo, Miss Angie Hesham (Postgraduate reseracher, University of Hull) (NAV0016)

3 Airbus (NAV0017)

4 BAE Systems (NAV0039)

5 BAE Systems plc (NAV0019)

6 Babcock (NAV0040)

7 Babcock International (NAV0027)

8 Blagden, Dr David (Senior Lecturer in International Security, University of Exeter) (NAV0020)

9 Caverley, Jonathan D. (Professor, US Naval War College) (NAV0042)

10 Centre for Historical Research, University of Wolverhampton (NAV0026)

11 Clark, Mr Robert (Research Fellow, Global Britain Programme, Henry Jackson Society) (NAV0038)

12 Confederation of Shipbuilding and Engineering Unions (NAV0031)

13 Cope, Mr Christopher (Parliamentary Correspondent, Warship World/ Navy Books) (NAV0007)

14 Dassault Systemes (NAV0014)

15 Defence Synergia (NAV0006)

16 Dunne, Philip (NAV0028)

17 Germond, Dr Basil (Senior Lecturer, Lancaster University) (NAV0004)

18 Haines, Steven (NAV0033)

19 Harland & Wolff (NAV0023)

20 Hartley, Professor Keith (Emeritus Professor of Economics, University of York) (NAV0010)

21 Human Security Centre (NAV0025)

22 Jones, Admiral Sir Philip (NAV0043)

23 Kaushal, Dr Sidharth (NAV0037)

24 Kennedy, Professor Greg (Professor of Strategic Foreign Policy and Director of the Corbett Centre for Maritime Policy Studies, King's College London) (NAV0005)

25 Linden, Cllr. Anthony (NAV0024)

26 Lockheed Martin (NAV0034)

27 Lockheed Martin UK (NAV0011)

28 London, James (NAV0021)

29 Ministry of Defence (NAV0045)

30 Ministry of Defence (NAV0044)

31 Ministry of Defence (NAV0030)

32 Molinelli, Gabriele (NAV0002)

33 Patalano, Dr Alessio (NAV0036)

34 Patel, Jag (NAV0003)

35 Serco (NAV0029)

36 Society of Maritime Industries (NAV0032)

37 Taylor, Professor Trevor (Director, Defence, Industries & Society Programme, RUSI) (NAV0013)

38 Till, Professor Geoffrey (Dudley Knox Chair of Naval History and Strategy, US Naval War College) (NAV0022)

39 Thales UK (NAV0018)

40 Vidal, Mr Michael (NAV0001)

41 techUK (NAV0012)

List of Reports from the Committee during the current Parliament

All publications from the Committee are available on the publications page of the Committee's website.

Session 2021–22

Number	Title	Reference
1st	Russia and Ukraine border tensions	HC 167
2nd	Protecting those who protect us: Women in the Armed Forces from Recruitment to Civilian Life	HC 154
1st Special	Obsolescent and outgunned: the British Army's armoured vehicle capability: Government Response to the Committee's Fifth Report of Session 2019–21	HC 221
2nd Special	Manpower or mindset: Defence's contribution to the UK's pandemic response: Government Response to the Committee's Sixth Report of Session 2019–21	HC 552
3rd Special	Russia and Ukraine border tensions: Government Response to the Committee's First Report	HC 725
4th Special	Protecting those who protect us: Women in the Armed Forces from Recruitment to Civilian Life: Government Response to the Committee's Second Report	HC 904

Session 2019–21

Number	Title	Reference
1st	In Search of Strategy—The 2020 Integrated Review	HC 165
2nd	The Security of 5G	HC 201
3rd	Pre-appointment hearing for the Service Complaints Ombudsman	HC 989
4th	Foreign Involvement in the Defence Supply Chain	HC 699
5th	Obsolescent and outgunned: the British Army's armoured vehicle capability	HC 659
6th	Manpower or mindset: Defence's contribution to the UK's pandemic response	HC 357
1st Special	Armed Forces Covenant Annual Report 2018: Government Response to the Committee's Eighteenth Report of Session 2017–19	HC 162
2nd Special	Drawing a Line: Protecting Veterans by a Statute of Limitations: Government Response to the Defence Committee's Seventeenth Report of Session 2017–19	HC 325
3rd Special	In Search of Strategy—The 2020 Integrated Review: Government Response to the Committee's First Report	HC 910

Number	Title	Reference
4th Special	The Security of 5G: Government Response to the Committee's Second Report	HC 1091
5th Special	Foreign Involvement in the Defence Supply Chain: Government Response to the Committee's Fourth Report	HC 1380