

Written evidence submitted by Northrop Grumman (ISD0030)

I. **Northrop Grumman Corporation:**

Northrop Grumman Corporation (NG) is a global aerospace, defence and security company. We are committed to advancing global security and human discovery in support of our customers' missions around the world. We do so by providing leading technology and national security solutions and services to markets around the world. We operate in more than 25 countries around the world. Northrop Grumman continues to expand and broaden our presence in global markets and strengthen our partnerships with local industry.

Northrop Grumman solves the toughest problems in space, aeronautics, defence and cyberspace to meet the ever evolving needs of our customers worldwide. Our 90,000 employees define possible every day using science, technology and engineering to create and deliver advanced systems, products and services.

The UK is an important and focus market for the company, we are proud to serve the Royal Air Force, Royal Navy, Army and wider security community and have done so for over eighty years. The UK is also important as a supplier base and a source for technology partners with Northrop Grumman's UK entities representing a major component of the company's global business portfolio outside of the US. Northrop Grumman operates from a number of sites across the UK with as well as at RAF Waddington, and sustains employment for more than 5,000 people in the many SMEs and other companies with whom we work as partners in the supply chain.

We maintain a strong focus on export business, an area important to our success, with sales into overseas markets from Northrop Grumman's UK entities accounting for more than 60% of our UK businesses. Northrop Grumman is an industry leader in all aspects of computer network operations and cyber security and is at the forefront of the challenge to find innovative solutions that can effectively defend networks and offer protection across the entire cyber domain.

II. **Purpose of the Review:**

At its core, we believe that the review should serve as an opportunity to present an up to date articulation of the UK's national security interests and the perceived threats to them; align the UK's defence and security policy and programmes with the protection and furthering of those interests within the Government's foreign policy aspirations and objectives for the country; and balance that policy and programme against the resources to be made available to deliver them. The objective should be coherence of mission, planning, budgets and execution.

From an industrial perspective, the value of the review is delivered through the vision, values and prioritisation of procurement requirements which the review provides. As exemplified by the Royal Air Force's 2017 revised strategy, a clear and succinct statement of objectives enables industry to more effectively anticipate, invest and deliver the future requirements in what is generally a long-lead sector. At a macro-level, the opportunity at hand is for the review to set cross departmental and cross-service direction for UK security

and defence which is set in the context of the UK's foreign policy and objectives. This should ensure that future aspirations are clearly articulated and balanced for the creation of a comprehensive, cohesive, affordable and enduring capability portfolio that meets the needs of UK security.

III. Process for the Review:

It is NG's view that process should be guided by both the nature of the threat and the required response. Accordingly, it is important to recognise that the threat which this review will address has evolved substantially from that which confronted the previous SDSR. A renewed focus on planning for great power competition is now required alongside the clear recognition that hybrid threats where near peers have merged with asymmetric actors are likely to dominate activity. As recent events have demonstrated, there is also material instability in the international system and the security environment has proven susceptible to rapid and fundamental change. The matured threat combined with the relative instability of the international system dictate a process which addresses the immediate capability gaps – to secure near-term operational advantage for the UK - whilst developing a clear long-term view of 2040 + beyond and lays the foundation for successive reviews.

Against this demanding set of requirements, a radical perspective will be necessary and clear trade-offs will need to be made. A review only of what is required in the future, without a thorough assessment of what is no longer needed will not deliver meaningful results. It is essential that the current force structure and equipment base be reviewed to understand what headroom can be delivered to enable investment in new capability. It will likewise be essential that the political, ethical and financial constraints be agreed and communicated to all parties early in the process to ensure an outcome which is both palatable and implementable. With "sacred cows" identified up-front and an ideal set of outcomes articulated, the review process can then be used to identify and to test the requirements for execution and to secure the essential ministerial buy-in.

As in the business world where long term, static planning is being increasingly replaced by more iterative approaches as cycle times contract, the review will need to provide for a degree of agility in its execution. Delaying decisions cannot be supported, as this will ultimately cost optionality. Accordingly, agility and adaptability cannot be sought in the process but should be embedded into the choices made by the review.

To manage this complex and dynamic process, a single centre of control is critical which must have the capability to analyse options and their trade-offs in the context of the future operational environment. In order to adjudicate the inputs from across departments and services against the agreed foreign policy, defence, security and political objectives it is recommended that the central team have representation from across the key stakeholder groupings. Industry should also be engaged to help advise on the risks associated with delivering the options under consideration such that the final conclusions of the review can be implemented with confidence of execution and in a meaningful time-scale.

IV. Coordination and Collaboration Required:

Against the expanding requirements and inevitably constrained budgets, coordination and collaboration – both internally (across departments and services) and externally, with key partners and allies – become essential enablers for optionality and execution. This is underscored by the inclusion of new domains, to include cyber and space, as integral components of the nation's security and defence infrastructure.

At a basic level, it is widely acknowledged that material leverage can be delivered through better integration of what already exists and it is recognised that cross-service collaboration in particular will be essential to delivering this value in the review. This is also true of the 'buying once and using many' approach to savings as it will be key to reduce the number of systems supported by the government by selecting systems that can be used across services and, where appropriate, across ministries.

More broadly, governments cannot afford to undertake the development or maintenance of a comprehensive set of capabilities individually, without regard for the actions, capabilities and accountabilities of their allies. As the review sets out to align defence and security with the country's broader foreign policy aspirations, it represents an ideal opportunity to align the UK's defence investment programme with that of its allies to ensure limited budgets are expended to realise collective and decisive capabilities to include comprehensive air dominance. Just as there is a need to ensure that the selected capabilities address a range of threats, huge savings and optionality is deliverable through more effective coordination with our Five-Eyes, NATO and European partners.

To accomplish such savings, the review must make a number of foundational decisions which will impact well beyond the time-frame of this review. It is recognised that most war-fighting at scale will, currently, necessarily be prosecuted as part of a coalition which is either (i) US-led or (ii) under-pinned by US capabilities. In this context, interoperability with the US and strengthened NATO execution capabilities will remain paramount. Improved coalition interoperability can deliver higher levels of survivability and lethality than the independent addition of incremental capabilities. To this end, open architecture systems offer huge opportunity and should be emphasised in the review. Use of open architectures maximises the UK's ability to adopt new technology and innovation, and rapidly respond to evolving threats. Adopting this approach enables the swift and easy integration of innovative technologies from SMEs and non-traditional defence suppliers. To be effectively delivered, however, these decisions must be made upfront and as part of a foreign policy decision rather than as part of individual procurement decisions. Adopting or coordinating compatibility with global, and in particular US, standards must be at the core of defence capability planning and hence procurement.

As the UK seeks to better leverage the R&D spend of our partners and allies, it will also need to be realistic about the level of controls which can be expected over that technology and to assess its own restrictions on the export of UK-developed IP. Our role at NG will be to find ways to blend US and UK IP to deliver sovereignty and freedom of action together with inwards investment to ensure the delivery of leading capability which is interoperable and exportable. As the UK seeks to procure and develop its next generation of defence capability, NG plans to support the UK as it invests to accelerate its defence transformation through import and indigenous development of leading UK ITAR-free and ITAR-light offerings.

V. Use of Evidence in the Review Process:

The decisions before this review are set to be both complex and to hold enduring implications. Deep, data-driven analysis is required to assess the potentially transformational impact of advanced networking, AI and machine learning, autonomy, cyber and transformational computing on the defence and security requirements of the nation. Adopting a scenario based and data-driven approach to the review is critical to making the complex trade-offs that will be necessary, as well as to building understanding of and buy-in to its conclusions.

Fortunately, new tools are now available to the government as they seek to make these decisions – across varied threats and all the defence lines of development. Just as data analytics stands to change the nature of warfare and how we defend ourselves, so to it can have material applications to helping government better understand what force structures and capabilities are optimum. Model based simulation is one such tool that could be invaluable. Model-based simulation offers strategic planners and operational commanders new tools to understand the impact of additional capability such as new platforms or communication links. We develop such physics based analytical models both for the UK and US defence community to support strategic decision making, operational analysis and acquisition decision making.

VI. Inclusion of a Procurement Review:

Developing a more rigorous and comprehensive vetting of the through-life-cycle cost of capability acquisition is essential to ensuring and supporting a leading military going forward. NG remains highly supportive of improved cost estimating and third party review embedded into the procurement process. However, while it is conventional to include defence procurement in the review to ensure improved execution and implementation, it is important that this activity not overtake the more foundational objectives of the review. This is particularly true given the limited time for the review. Rather, from an industry perspective, the review must create the framework for procurement but it does not necessarily need to address the procurement process itself. It is understood that the review will determine the types of capabilities – strategic and tactical – which will need to be procured together with the acquisition priorities, foreign policy context and financial envelope. Requirements for the procurement system are then understood to be a function of this foundational framework and it with this framework in place that a process review can be undertaken to ensure that the procurement apparatus is fit for purpose and positioned to deliver value for money.

VII. Accounting for Financial Realities:

It is essential that the review aims to agree and articulate priorities within the financial envelopes that may be available. An unconstrained review is neither realistic nor desirable and could, ultimately, inject increased costs and time-delays. This is particularly true of this review, as it arrives in a post-COVID budget environment and seeks to guide decisions on a host of strategic, long-range and complex capabilities. NG recognise and support the need

for radical focus from the government. Understanding and selecting where to apply limited financial resources available to defence is ultimately the single largest driver of delivering value for money from the forthcoming review and will determine the executability of the review.

Managing within the fiscal realities is also likely to deliver different conclusions than a review conducted absent thought to resourcing. While few changes of platforms can reasonably be considered in the short to medium term, step-change in capability can still be delivered through subsystem upgrades. Equally, an emphasis on 'military-off-the-shelf' (MOTS) can reduce the through-life-cost of ownership and alternate sustainment approaches offer opportunities but these must be aligned with the broader assumptions around coalition operations. Most notably, defining the potential financial scenarios for the review will necessarily lead to an increased focus on exportability of the solutions. Type 26 / 31 have both caught the eye of the international customers and show the value of 'design for export' in providing for near interchangeability between allies and improved affordability and sustainability. Such decisions, however, are best taken upfront and should be aligned with the rest of the foreign policy objectives thus belonging within the review.

VIII. Planning for Implementation of the Review:

Implementation is seen as key to differentiating this review from previous reviews. Notably, the current political construct offers a unique set of circumstances whereby, with the benefit of the Government's strong mandate, there is an opportunity to deliver improved implementation of the review with strong leadership running from inception through to execution. This requires a commitment to clear accountability in the process and to continuity of leadership following the review.

As in a complex acquisition or a change management programme, there must be an implementation plan with an associated team that provide continuity and focus following the review. This team should work to embed the findings of the review across departments and help drive, coordinate and assure the implementation. Early engagement of the departments that will be responsible for overseeing execution of the recommendations will be important to ensure that implementation issues are identified and addressed up-front.

By way of example, Australia has managed implementation of their review to great effect and can provide a model. There, clear and open plans have been agreed at a Joint-level and published – offering a single, centralised and prioritised view of how policy is to be executed across budgets, acquisition and programmed investment. This has been delivered through three linked documents to include the: (i) Defence White Paper; (ii) Integrated investment; and (iii) Defence Industry Policy Statement. Such documents frame the strategy, and decompose the strategy in to the associated investments – with priorities, budgets, time-lines and identify key areas of industrial cooperation, collaboration and investment. This, in turn, has allowed industry to plan, invest and build the teams and broader relationships to respond in the best way meeting the full intent of the government's needs; enabling Australia's budget to reach further than otherwise.

IX. Final Thoughts + Conclusions:

NG welcome the review and recognise its importance in delivering a sustainable defence and security apparatus which is both tailored to the threats of today and prepared for the fights of tomorrow. We are grateful for the opportunity to add comment and look forward to having the opportunity to contribute to and support the whole of the UK government as it prepares to undertake the review.

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