

Written evidence submitted by Thales

Introduction

The UK must be equipped to defend its own assets, own viable space capabilities to trade with international partners, address climate change and improve Britain's productivity.

Together, Thales and our Joint Venture Thales Alenia Space have ambitions to grow the UK space sector and support the HMG ambitions for the UK to be a significant global actor in space and a leading science super power.

This submission is made on behalf of Thales Alenia Space and Thales.

Thales is a global technology business operating across the Aerospace, Transport, Space, Digital Identity, Security, and Defence markets. Worldwide we employ over 80,000 people across 68 countries. Thales in the UK employs over 7,000 people, including 4,500 highly skilled engineers, across 10 key sites.

Thales Alenia Space is a joint venture between Thales (67%) and Leonardo (33%), has over 40 years' experience of delivering telecommunications, navigation, Earth observation, environmental management, exploration, science and orbital infrastructures. Thales Alenia Space has around 7,700 employees in 18 sites in 11 countries across Europe and the USA.

Thales Alenia Space opened its UK operation in 2014 to make a significant contribution to the UK's growing and dynamic space sector by developing new breakthrough innovations and currently has a highly skilled workforce of c. 200 people across facilities in Bristol, Harwell and Belfast. Space scientists and engineering teams in Bristol design and build remote sensing missions and instruments for Earth observation and Science missions. The Thales Alenia Space teams in Harwell are world leaders in the design of electric propulsion modules for satellite systems which are built in Thales' facility in Belfast.

This submission welcomes the Government's clear ambitions for civil and defence space, but we believe that there is the need for Government to act to allow the market to reach its potential. It is imperative that the National Space Strategy (NSS) is implemented in such a way to develop a broader supply chain, encourage additional prime level industrial players and enhance the attractiveness of inward investment to the whole space industrial ecosystem.

Questions

How should the UK Government seek to further develop its strategic relationships and interoperability with allies?

- In line with direction in the Integrated Review and recent policy papers, Thales supports the MOD aspiration to adopt a range of capabilities through the Own, Collaborate and Access model.
- Where allies have relevant capabilities, securing 'Access' to these should be the initial step. Where there is benefit in a collaborative approach including pooled resources and burden sharing the 'Collaborate' option is advantageous.
- Beyond these relationships, the 'Own' aspect should be employed for strategic capabilities, operational independence and as a means of providing high value niche capabilities that are operationally relevant to our allies.

Where can the UK most effectively develop and deploy its own sovereign defence capabilities, with particular regard to: Space Situational Awareness; PNT (Position, Navigation, Timing) services, in the context of the UK's exit from the EU's Galileo and EGNOS programmes; Intelligence, Surveillance and Reconnaissance; and Communications

- We recommend the acceleration of strategic UK space infrastructure programmes and that it is done through open competition, where it stimulates growth of high-tech supply chains and maintains critical skills in Position, Navigation and Timing (PNT) and critical national resiliency, Intelligence Surveillance and Reconnaissance and defence communications.
- PNT - Navigating our planet has been transformed by space based systems. Thales Alenia Space developed the European Geostationary Navigation Overlay Service (EGNOS) satellite system, which is used today to improve the performance of global navigation satellite systems (such as GPS) for people in Europe. South Korean space agency KARI chose Thales Alenia Space to produce KASS, their own version of EGNOS. We also are prime contractor for the Galileo Mission Segment (GMS) and the Galileo Security Facility (GSF). In 2021, we were awarded a contract to build 6 new Galileo Second Generation navigation satellites
- Intelligence, Surveillance and Reconnaissance (ISR) – Thales is a world leader in ISR systems and manufactures world beating sensor technologies in the UK. There is opportunity to build on existing UK Research and Development (R&D) activity to rapidly demonstrate UK sovereign capability. We believe that the UK is well positioned to develop and deploy sovereign capabilities in the Space ISR domain with unique advantages for operational independence.
- In the UK, we have designed a new revolutionary satellite concept, called Skimsat, which is designed to operate in Very Low Earth Orbit. Skimsat could transform the market by dramatically reducing the cost of Earth observation without compromising performance by lowering the operational altitude to new depths.
- The Skimsat concept is a small satellite aimed at emerging new space customers which, by mixing-up "NewSpace" market trends, intends to become the new and preferred solution for a range of missions including Earth observation.
- Communications - Thales Alenia Space is a world leader in the development of both civilian and military communications satellites. We are the leading domestic supplier in France, with four generations of Syracuse satellites, as well as providing two Sicral first generation satellites plus the second-generation Sicral 2 for the Italian defence ministry, Athena-Fidus for military and

dual (civil-military) telecommunications for France and Italy, and two Satcom BW satellites for Germany. Additionally we are a leading provider of civilian systems having built all the telecommunications constellations in orbit, with a total of 125 satellites deployed. As such, we are keen to play a significant role in SKYNET 6 – providing a competitive environment can be established.

- Along with space based assets, it is important to be aware of the ground based sensor technologies that can enhance Space Situational Awareness; including next generation (Active Electronically Scanned Array) ground based radar that can also provide space situational awareness.
- Thales' SMART-L Multi Mission radar is currently being delivered to the Royal Netherlands Air Force and Navy. It can provide Air Defence coverage (out to 480km), Ballistic Missile Defence (BMD) and Space Situational Awareness (out to 2000km) simultaneously. The SMART-L Multi Mission radar, on land or at sea, would deliver a sensor capability that can monitor satellites in VLEO and LEO orbits, whilst also conducting Air Defence and BMD tasks simultaneously without spending huge amounts of money on single task sensors.

How vulnerable are our space assets to deliberate attack, both physical and otherwise, and what steps can be taken to improve their resilience (with regard both to defence capabilities and other critical national infrastructure)?

- As with almost all aspects of society, space must consider how its assets can be secure against Electromagnetic and cyberattack. We are looking at how we can leverage Thales in the UK's role providing electromagnetic protection and high-grade crypto systems for the UK government and our world leading Electronic Warfare, cyber and digital security capabilities to underpin satellite and satellite network security.
- Although currently stated from a civil space exploration perspective, habited missions could become a very defence focused issue when seen beyond research and sustainment of space-based missions.
- Logistics and habitation support will be critical to the success of other planetary missions; moon based missions could be a critical jumping off point for other world missions in the future. A number of international entities- wider Europe, the US and, China and Russia- are looking at habited missions and other planetary logistics are focussing on moon habited missions-and as a launch pad to exploration further a- field, the UK must not lose sight of these either.
- TAS in the UK is part of the programme to deliver Europe's two main modules for the upcoming Lunar Orbital Platform–Gateway (LOP-G): I-HAB (International Habitat) and the ESPRIT communications and refuelling module. TAS in the UK will support the delivery of the chemical refuelling system.
- ESPRIT (European System Providing Refuelling, Infrastructure and Telecommunications) consists in 2 two main elements. The HLCS (Halo Lunar Communication System) which ensures the communications between the Gateway and the Moon and the ERM (ESPRIT Refuelling Module) which combines the refuelling of the Gateway with a small pressurized module with windows.

How can defence industrial policy ensure that investment and innovation in in the private space sector is harnessed to align with the UK's defence requirements?

- In our view, there must be a holistic approach between defence, scientific, commercial and wider government requirements; being able to work collaboratively will ensure the maximum value for UK government investment and ensuring we create the most effective industrial base to support the UK ambitions.
- For example, OneWeb Gen 2 could offer complimentary PNT services to the MOD- but it will need ambition from Government and technological investment
- The UK space industry must be an ecosystem of large, midsize and small companies and not dominated by one large prime that holds a monopoly. Thales UK and Thales Alenia Space have brought IPR and investment into the UK and would be prepared to bring more if there is clear appetite from Government and the right support.
- The NSS should include concrete steps to diversify and mature the UK space supply chain to increase the addressable market for the large number of space companies in the UK, support long term inward investment and enable them to align strategies with the UK Space Strategy and invest in R&D accordingly, thus maximising exploitation of innovation.

Have recent machinery of government changes ensured a joined-up and coherent approach to defence space policy both across Whitehall and within the MoD? What further improvements could be made?

- As referenced above, Defence Space should not be isolated from the wide UK space enterprise. As we are beginning to see with some of the systems and technologies in defence, the MoD should look to the activity in civil space to see where technologies are being developed and how they could be lifted to fit into a defence setting. This will maximise value for money and reduce product development and upgrade timeframes.

What should be the priorities of the new Space Command, and how will its structures facilitate integration across all military domains and co-operation with commercial space operations?

- The new UK Space Command has the opportunity to be a focal point for Space as a new operating domain within Defence. As one of the 5 domains within the Multi-Domain Integration initiative, UK Space Command is able to use its joint and pervasive nature to bring capability advantages into the other domains and generate new synergies. In doing so, UK Space Command must be able to provide accurate and timely Space Domain Awareness, provide the ISR view from the 'high ground' and be able to protect our vital access to Space-based networks and capabilities.

How can the Ministry of Defence ensure that it attracts, develops and retains high calibre space specialists in both policy and operational roles?

- The UK government's stated ambition to be a meaningful player in Space by 2030 demands that both UK Government and UK Industry is able to attract, develop and retain high calibre space specialists. MoD's aspirations for policy and operational roles sit within this context. Historically, UK Industry and academia has performed well in this regard for what is an interesting and rewarding domain.
- In order to preserve and expand this, UK Government and MoD must show progress towards the global ambition and communicate widely the attractions of a MOD career in the Space Industry.

Aligning with wider STEM initiatives, professional, educational and academic institutions and strengthening public engagement can go a long way.

- Inevitably, the challenge will become a whole force endeavour and career development initiatives will be required that mirror those currently being explored in the Cyber and Digital domains. Together MOD and Industry is well placed to offer attractive career propositions in this exciting growth domain.
- The typical model being outdated where space is concerned – a 2-3 year placement means you never stay long enough to become an expert in space as a domain; Government should consider swapping people with industry more readily or having multiple back to back tours in different aspects of the space domain. If there was sufficient resource, MoD could consider supporting funding for training of space specialists in industry.

13th July 2021