



UK Engagement with Space Committee

Uncorrected oral evidence

Monday 17 March 2025

4.40 pm

Watch the meeting

Members present: Lord Clement-Jones (The Chair); Lord Booth-Smith; Baroness Donaghy; Lord Lansley; Viscount Stansgate; Baroness Stowell of Beeston; Lord Tarassenko.

In the absence of Baroness Ashton of Upholland, Lord Clement-Jones was called to the Chair.

Evidence Session No. 5

Heard in Public

Questions 45 – 56

Witnesses

I: Richard Thorburn, Chief Operating Officer, Thales Alenia Space UK; Patrick Wood, Head of Space Systems UK, Airbus.

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Examination of witnesses

Richard Thorburn and Patrick Wood.

Q45 **The Chair:** Welcome to the second session of the committee this afternoon, and welcome to our witnesses: Patrick Wood, the head of Space Systems UK at Airbus Defence and Space, and Richard Thorburn, the chief operating officer of Thales Alenia Space UK. Perhaps you would just like to introduce yourselves before I start the questioning.

Could you tell us a bit about the firms you represent and your role in the UK's space sector? At the same time, maybe you could characterise the UK space sector and say where you believe our competitive strengths lie. Perhaps we could start with you, Patrick.

Patrick Wood: I am senior vice president for Airbus Defence and Space. We are undoubtedly the UK and Europe's largest space company and are involved in all aspects of space. From our European company, we are involved in earth observation, science, exploration, telecommunications, defence, launchers, human spaceflight and downstream services.

If I can jump in and start to have a view about the UK, our UK company has been in existence since before the 1970s. We started in launchers, went into telecommunications satellites and have really specialised in large telecommunications satellites. Along that journey, we have also developed a lot of very key skills as an entity. We are heavily involved in European Space Agency science and exploration missions.

We are the UK's sovereign space experts for military satellite telecommunications. I started back in 1996 on Skynet 4. I was the programme director for Skynet 5, launched all the spacecraft and built all the ground segment satellite network operation centres. Of course, Airbus is currently building Skynet 6A in its factory and bidding for the future, which we have been able to do because we are in commercial telecommunication satellites, institutional science and exploration as well as defence. We create a capability that allows us to share that expertise—developing engineers and programme management, quality material scientists and the supply chain in the UK.

We have 33 satellites going through the UK at the moment, 14 of which are large commercial telecommunications satellites. Of those 14 satellites, three are military, and we have 14 low earth orbit satellites going through, which are for the UK national missions. We also have quite a number of institutional spacecraft going through: TRUTHS, Vigil, FORUM and Biomass, which is actually at the launch site at the moment. We are also working on the future ExoMars, the Mars rover.

We believe we are a very credible space company in the UK. Our mission is not just to develop capability but to develop capability in the supply chain, because that is really essential and the UK supply chain is weaker than it needs to be to compete globally.



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In terms of what is expert for the UK, we are the centre of competence for large, complex, mechanical platforms and we do that work across Europe. So we supply mechanical platforms, and when I say mechanical platforms we are talking about spacecraft that end up being multi-tonne spacecraft for either climate change monitoring, military missions or commercial telecoms. We are also the lead expertise—particularly in our Portsmouth factory—for telecommunications and military defence.

Within our family as well, we have SSTL. I did not mention that I am an ex-CEO of SSTL, so it is very much in the family and we are very proud to own it. It runs arm's length and is one of the world's best-known small satellite companies. We are super proud to be its shareholder.

Lord Tarassenko: A quick point of clarification: you mentioned that you have 31 satellites going through.

Patrick Wood: It is 33, sorry; I might have said the wrong number.

Lord Tarassenko: What do you mean by "going through"? Are they about to be launched?

Patrick Wood: They are going through design. We do everything from concept. It is really important to understand the depth of knowledge to go from a concept all the way through to final delivery. My operational job is running assembly integration and test across Europe; I have a European role. If you take the JUICE mission that is on its way to Jupiter, the team in—

The Chair: The Bell is ringing for a vote; I will ask you to finish that phrase and then we will suspend for a vote.

Lord Tarassenko: Who is launching these satellites for you?

Patrick Wood: In terms of a mission like JUICE, we have the team that designed all the orbital mechanics, doing all the slingshots, so real space design. In terms of launch, sometimes our customers define the launch company we use. Other times, we might advise them which launch company. Recently, a lot have gone up on Falcon 9 SpaceX launchers because Ariane has not been so available. One role of the European Space Agency is to have freedom of access to space, and obviously, with the delay in Ariane 6 and some issues that Vega has had, the world has had to rely on Falcon 9 launchers.

The Chair: Thank you very much. We need to suspend the meeting and will be back shortly.

Sitting suspended.

Q46 **The Chair:** Welcome back, everybody; I am sorry we were interrupted by two votes this time. I am going to come to you, Richard, with the same question that I put to Patrick.



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Richard Thorburn: Thank you for the opportunity to talk to you in today's committee meeting. First, I will give you a quick introduction of Thales Alenia Space as an organisation. We are a joint venture, 67% owned by Thales and 33% by Leonardo; those two organisations come together to form Thales Alenia Space. We also partner with Telespazio, which is the shareholding reversed—Leonardo two-thirds, Thales one-third—to form the Space Alliance, and we offer the complete range of services, very similar to those you heard from my colleague, Pat, in Airbus.

Thales Alenia Space's consolidated revenue was about £2.2 billion in 2023, and we have around 8,000 employees across several sites in Europe: France, Italy, Spain, Switzerland, Belgium, Luxembourg, and of course the United Kingdom. We have over 40 years of expertise in telecommunications, navigation, earth observation, environment management, exploration, science and orbital infrastructures.

Looking a little closer at my role, I am the CEO of Thales Alenia Space in the UK, and my team focuses on designing propulsion solutions to keep telecommunication satellites in geostationary orbit, as well as solutions for spacecraft in lunar orbit and landing, alongside other innovative space missions. We are also the propulsion centre of competence for the whole of Thales Alenia Space. Thales Alenia Space UK employs approximately 160 people, so a significantly smaller organisation than Airbus UK, which is the significant prime in the space sector. We are based in the Harwell Science and Innovation Campus, which is where our management team is based and where we do our designs. In Belfast, Northern Ireland, we manufacture and assemble our equipment.

You asked about our expertise in our organisation; that is it: propulsion and delivering propulsion. Without propulsion, there are no missions. Without the missions, you will not have the need for propulsion. We partner with a large number of different groups in order for us to deliver propulsion to the marketplace.

You also asked about characterising the UK space sector, so I may move on to the second part of the question. The UK has a very rich heritage in space innovation, a history of building more small satellites than any other country in Europe, a thriving earth observation space data analytics community, and strong links with academia, which I think will come up in a later question. I heard also in the previous session you were talking about UK launch sites, something the UK Space Agency and the Government are interested in and continue to be pushing forward with.

Looking at the market structure in the UK—maybe Pat would like to contribute to this as well—the UK space sector is highly concentrated with a very small number of large organisations. There is one major prime in the UK, Airbus, and then we have about 20 organisations accounting for 75% of the remainder of the space activity in the UK. Perhaps most interestingly, for the final 10% of that money that is spent in the UK, there are 1,600 organisations. That is useful just to show where our



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organisation fits; it is one of the biggest in the UK, but there is an extremely dominant prime player in the marketplace.

Q47 **Baroness Donaghy:** I want to ask you about the challenges and opportunities that your businesses are likely to face. Would you say you are optimists about the future? With inflation and difficulty with supply chains, some job losses and skill shortages, this might be quite a difficult time for your industry. Would you put yourself on the optimistic side?

Patrick Wood: I have always been known as being a glass-half-full type of person. The UK has a fantastic history in space and great potential for the future. You are right: there are a lot of challenges. The change in the market around telecommunications is a significant one. If you go back five or 10 years, there was a replacement market of about 20 large GEO telecommunication satellites on an annual basis. We typically had market access to about half of those, we bid and typically won half of that, so we have typically built 25% of the large GEO telecommunication satellites that exist in the world.

We have seen that number reduce. At the moment, it is probably something like a world market of 10 large GEO satellites, but our market share stays the same. We have also seen a significant increase in low earth orbit constellations; large telecommunication constellations. The volume of data being moved around space is growing and increasing; just the methods that are used to do that are changing. Certainly, with the geopolitical risks of undersea cables, people are going back to being more reliant on space-based telecommunications.

As a company, we were a joint venture in building the OneWeb satellites; we built 650 satellites in our Florida factory and are continuing to build replacements for Eutelsat OneWeb in Europe. There is great opportunity in telecommunications, and people who gave evidence in the last session also talked about the opportunities around 5G, 6G and non-terrestrial networks, which is quite significant.

What I see as a real opportunity is to take the military work we do into both the commercial world and the other way around—take the commercial work and use it in the military. We have done that a lot over the last decades. If you take our very high-speed digital signal processor that we developed under European Space Agency funding originally back in the 1990s, we then used it on a commercial mission, flew an upgraded version on Skynet 5 UK military satellite system, upgraded it again with the European Space Agency—our own investment and UK Space Agency investment—and upgraded it to fly for the larger commercial telecommunications. That is now being used again with the modification to go on to Skynet 6A, the current generation.

The opportunities that the UK now has in export for military satellite communications are quite significant. We have a massive expertise in this country in designing hardened, reliable telecommunications payloads. Ultimately, people will need the ability to use that dual-use technology



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and protection in all multi orbits, in every orbit, to really protect spacecraft and the flow of data because low earth orbit will become a very much more contested environment. At the end of the day, it is about data.

You then have the opportunity with navigation; navigation technology has changed. Yes, it is disappointing that we are no longer supplying the European Galileo system. When I was CEO of SSTL, we supplied all the payloads for Galileo, so I understand probably more than most what we have lost in that opportunity. But actually, we continue to supply into the second generation of Galileo the one piece of UK technology that the Europeans do not have, which is the digital processor from our Portsmouth site. So we do have one element that is still being used to deliver the real core capability inside Galileo.

There are opportunities, but it is about making sure we have a clear strategy, vision and road map as to what the UK wants in terms of space. I see the last five years we have had as, "Well, let's try and spread the investment across a huge number of companies". Richard's comment about there being 1,600 companies that account for 10% of the business creates a lot of topics that are sometimes not necessarily priorities. There may be good pieces of technology, but are they priorities that will lead to industrial business?

Richard Thorburn: On the 1,600, of course, they create wonderful, innovative ideas, so they are a fertile ground for fantastic things to occur. There is an opportunity for the bigger space companies like ours to work with those in partnership to bring those things to life. We could also talk about how the Government could engage in picking some of those things that are really going to feature as part of the space economy.

Pat very comprehensively covered the challenges in telecoms and spoke about dual-use technologies and navigation; I may just cover some areas that I also made notes of, but that are not the same things, albeit I will make it very clear those same headwinds have occurred to our organisation and are things we need to overcome as challenges and opportunities.

A couple of things that were mentioned in the question itself were increasing inflation and a lack of resilience in the supply chain. Particularly when we have one or two suppliers, there is a real risk to organisational output if something happens in the marketplace. Then there is the uncertain geopolitical landscape, which could change the marketplace quite significantly, and we have to be nimble and adapt to that. All those forces are impacting the industry at large, and the space sector is not immune to them.

The question mentioned looking at opportunities and asked whether I am an optimist. Well, yes, in a job like mine, you have to be optimistic. Globally, there continues to be a drive for greater innovation and connectivity, which is exciting. The marketplace is buoyant and certainly



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attractive. When I talk to people about the work we do and some really prestigious projects that we are involved in, it lights people up, and that is a real thing that we can grab hold of to create some excitement about what we do in the space sector.

There is obviously pressure on earth's resources and we need to think about how we limit the impact of climate change—be that fire, flood, drought, wind, agricultural needs—much of which depends on space or space-derived data services, as discussed in the previous session. How do we predict and plan for those things, and then mitigate and manage them?

Looking at the future from Thales Alenia Space's perspective, we expect the global space economy to continue to grow, in large part due to the cheaper access to space, and maybe later we will talk about SpaceX and the impact it has had. It has also reduced the cost of getting into space quite significantly, which is a huge advantage for many small companies that are trying to get their products out into space.

I talk about people finding space and what we do interesting, but it is very exciting to talk about colonising the moon, travelling to Mars and some deep space missions. To know that my organisation has recently signed a contract for the EL3 Argonaut lunar lander and that my people in Harwell and Belfast are actually working on those programmes is extremely exciting and hugely motivating. I feel that lifts everybody in our marketplace when really prestigious contracts like that are landed.

Q48 Lord Booth-Smith: Moving beyond the short term, I wondered if you would be able to talk about the slightly longer-term growth areas you see and, in particular, whether there are any early-stage R&D bets that your organisations are making that you think will be interesting areas for the future.

Richard Thorburn: Looking beyond those short-term horizons, we maybe think about space sustainability. There has been quite a lot of excellent work done by Joanne Wheeler under the Earth Space Sustainability Initiative, and we are meeting with Joanne and the team in April to discuss that further. We think there are real opportunities on sustainability and sustainable space.

In-orbit servicing and manufacturing—the repairing and repurposing of space assets—is definitely something that needs further deep thought. This could also include the disposal of items that have become space debris and how we take them out of orbit in order to clear space. That is something we will also develop.

Another area is space domain awareness, both in the civil and military domains. How do you protect your assets once you have invested so much in them and got them up there? How do you make sure they continue to operate and will not be impacted by others? I have mentioned debris collision tracking and avoidance.



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Perhaps the other area where there is a potential for good R&D bets—I think that is the phrase that was placed—is climate monitoring, so solar storms, flooding and the improvement of weather prediction models. That is clearly only going to be a demand that increases as the world changes and the demand for that data is ever increasing.

Patrick Wood: I will not go over the same topics; that was a really great list from Richard. Just to add to it, a really interesting thing we are seeing is the beginning of very large launches because that changes the industrial economics of what you can put up into space. I have been in conversations where people start talking about where you could put much larger structures and different materials. A lot of the materials we use are very specialist and potentially precious metals, so there is a real opportunity to change the types of materials because we are using larger launch vehicles.

The other area, which Richard touched on, is solar weather and the ability to understand far more about the impact the sun has on earth, particularly risking telecommunications, solar storms and things like that.

There are enormous opportunities with robotics, AI, quantum, of course, and what goes beyond quantum, because as you say, you are looking longer term into the future and at security, observation of space assets, protecting and defending space assets, space domain awareness, space situational awareness, all those things and, for me, larger launch vehicles.

As digital electronics is miniaturised and continues to miniaturise—flying smaller and smaller sats—what impact will satellites that the Surrey Satellite Technology designs and builds in the future have on them? There will be much more functionality, new sensors and hyperspectral images. In the mid-term, there are some exciting changes as well.

Q49 **Baroness Stowell of Beeston:** I wanted to ask about your views on the UK's space policy but, in the interests of time, I would be grateful if you could focus your answer on your view of our policy since the *National Space Strategy* was launched in 2021 and how the UK's approach to space policy compares to other European countries. We have heard France, Germany and Italy mentioned several times, because they spend a greater proportion of GDP in this area than the UK. Indeed, you may have heard the witnesses in the last panel say that our public funding does not match our ambition.

As operating businessmen, does that matter? When I ask it like that, one reason I do so is that, in the world of AI, there is always a comparison drawn between the UK and France, which has invested more in public funding into the AI sector, and yet the UK is still ahead of France in the overall ecosystem. How do you think we compare? Noting we are not spending as much publicly, does it really matter for businesses operating here in this country?



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Patrick Wood: It is true that the French, Italians and Germans spend a significant amount. They have very large space agencies, as was mentioned in the previous meeting; DLR has something like 10,000 people, and is involved in a lot of research. In the UK, we do a lot with much smaller, focused organisations. The work of our academics and universities is really at the forefront; there are some very good world-leading universities that are renowned across the world in space.

One challenge we have is connecting government vision, strategy and policy with academia and industry, and not having a huge list of topics, but three, four or five key topics that could really benefit for the good of the UK. A message I always said to Space Command, for instance, is, "Use the prime organisations you already have in the UK. We can build a mission. We can be directed to use payloads, suppliers and academia to bring in new capability. What we bring is the expertise in being able to put that infrastructure in space in a way that will be reliable and operate appropriately".

There is a lot of talk about, "Well, we need to do a demo mission; we need to do a technology demonstrator". With our work with the European Space Agency, we go straight from new technology into a 15-year mission with the European Space Agency. It is about us all understanding what capability the larger primes, tier 1 and tier 2 supply chains have, and how we can work with academia, some smaller start-ups and SMEs, because we have a phenomenal amount of good ideas in this country. When you meet start-ups and SMEs, a lot get very frustrated because they are encouraged to, "Okay, you've got this great payload idea; now you've got to build a spacecraft around it". If you look at the industry in the UK, we have companies that can do that. Why do we not have funding mechanisms that allow organisations to focus on what they are good at and enable them to focus on either the downstream application or the upstream technology? The function of a prime is often to work with anyone to actually make that vision up in orbit.

Richard Thorburn: You spoke about AI, and Thales is working hard on AI and looking at how we can really make secure AI for all our clients and customers and integrate it into our products.

I am quite interested in the question that was posed, which is that we had not spent as much money as another nation but were still quite leading. Pat touched upon it but, if I may stress the point, we have extraordinary academic capability in this country. I believe that the UK scientific community are inventors, and that inventiveness, foresight and thinking are actually what drive us to have this great capability.

Your question was does it matter if we have a UK mission? It probably does matter because if the UK was to say, "This is something that we want to go further in", that is a really clear signal to industry that we can then all start to build our investment plans against. We can start to look forward as a collective, rather than the potential of there being many



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different small things, and as industry, we have to try to pick the right one that is going to fit in the marketplace.

Baroness Stowell of Beeston: You would say yes to more public funding as a percentage of GDP.

Richard Thorburn: Yes.

Q50 **Baroness Donaghy:** From your firms' perspectives, how much do you value the UK's relationship with the European Space Agency and can you spell out the ways in which it helps and possibly hinders? More generally, in terms of the UK's international relationships, are there any you would like to see developed or strengthened? I am sorry; that is rather a lot.

Patrick Wood: No, it is a good question. We have worked hand in glove with the European Space Agency for many decades. In our commercial satellite, we have done early research and development on mechanical platforms, payload technology and space products, which has enabled us to have a commercial satellite business in telecommunications.

Similarly, although the European Space Agency does not specifically develop military technology, a lot of what we fly in orbit is dual-use technology, whether it is formation flying, rendezvous and dock, high-precision lasers, high-precision attitude and orbit control systems; these are all dual-use systems. We use our work with the European Space Agency to train our teams, our engineers and the supply chain, and to leap-frog up the technology readiness levels—in effect, maturing technology to allow us to use that on future missions.

I was just reflecting that many of our missions would not exist today without it. We have done 12 interplanetary missions and built 132 large GEO telecommunication satellites over 40 years. Maybe 132 is not that many, but these are three to four tonnes, and these days nearly six and a half tonnes. They provide the global interconnect flying in orbit. A lot of capability has been developed.

The previous two people giving evidence said some excellent words around the European Space Agency. If I am cutting my answer short, I would just echo that it is both technology development and training people. The only way to get experience in being able to understand a space mission from start to finish is to go through it. We have the great capability—particularly in our organisation as a prime—to have gone from concept, through design, through the supply chain knowledge, through the build process, testing, launch and then satellite operations. That builds real skills, and ESA enables us to do that.

One of your final, add-on questions was where we should strengthen internationally. Five years ago, Australia did not have a space agency but has understood the importance of having one and developed it. Japan has always had a very good telecommunications company, JSAT, as well as a space agency, JAXA. It also recognises that Europe has technology, and I



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have certainly hosted numerous trade delegations from Asia—particularly Japan—because it is interested in UK technology and export.

In our military, we are pursuing in the order of £8 billion to £10 billion worth of export opportunities related to military satellite technology in countries such as Japan. We have bid into Australia and are bidding into Canada and various Middle East countries. Countries want our technology and a lot of that originated from early research with the European Space Agency.

Richard Thorburn: I may talk quickly about Thales Alenia Space and ESA. TAS UK's incorporation was in 2014, and ESA has been hugely supportive of us. I just want to highlight a couple of contracts that have come through with our organisation. Just in the last six months, we have had over £120 million worth of order intake from activity with ESA looking at the Argonaut lander and the ESPRIT module of the Lunar Gateway—so the space station around the moon and the refuelling capability for that.

ESA provides my organisation in the UK, and more widely, Thales Alenia Space, the opportunity to have access to gigantic science and exploration missions, and ESA brings that together for all the nation states that contribute to it, which is a huge advantage. Pat put very eloquently that some of these things would never have happened without that weight of investment and multiple nations pushing together.

Perhaps the last thing I will mention about ESA in particular is that it has also instituted ECSAT in Harwell, which is its office, and it is looking for opportunities to really leverage that presence in the UK. So being there with ECSAT in Harwell—to have the conversations around how we can leverage that relationship—is really powerful for the UK space sector.

The Chair: We now need to suspend the session because of a vote and we will be back shortly.

Sitting suspended.

The Chair: We had finished a question from Baroness Donaghy and it is now over to Lord Booth-Smith.

Q51 **Lord Booth-Smith:** There has been a bit of chatter recently, but it feels cyclical—it is cyclical because there are multiple versions of it—about potential mergers of some companies, including your two and maybe another. I would not expect you to comment directly on that—you are more than welcome to if you wish—but I wondered what your perspective in abstract was on the case to be made for doing something like that. If you find that maybe a little too close to home to answer, why do you think that that chatter is cyclical? What drives it? Why do people keep coming back to it, making it and suggesting it?

Richard Thorburn: Maybe I can answer first. The first thing is to say that I am not in a position to comment on the media speculation, but I



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can give you the Thales Group position, which may help us to frame this part of the conversation. The Thales Group's position is that it has confirmed that early discussions have taken place between the three organisations to explore a potential collaboration in that space business.

Independently of the results of those discussions, Thales's priority remains to focus on the Thales Alenia Space Adaptation Plan, which was launched in March 2024, a year ago. That plan is for Thales Alenia Space to restore sustainable profitability in the mid-term by lowering our costs and adapting our strategy in the telecoms market. The plan is undertaken gradually, carefully, and in consultation with social partners—unions—and is designed to preserve and develop the skills within Thales thanks to growing opportunities and activities in other businesses of our group, looking to redeploy.

The Chair: It is pretty much the same from your point of view as well, presumably, Patrick.

Patrick Wood: I was just looking at the words from our corporate and they are very similar: "There are preliminary and non-binding discussions with Thales and Leonardo, exploring scenarios to consolidate and strengthen European space". I think what you were alluding to is this is not the first time; what drives this conversation?

Lord Booth-Smith: You guys will do business in the way you want to do business; that is up to you. It is more about why it is that we periodically have this kind of abstract conversation. What is driving that?

Patrick Wood: It is subject of public record of our group CEO that, for us to compete against the US market, there is an issue about scale, efficiency and optimisation of industrial capabilities. Those are some things that drive the thinking. It is also about looking at the kinds of investment from Governments across Europe, at industrial square metres, overlap and the underutilised capacity that exists across Europe. I am not talking specifically about any company but, across Europe and the UK, there is a capacity issue that is being addressed.

Lord Booth-Smith: Would you not have concerns of an Eric Berger-type view, that you risk also running into potentially higher prices and a loss in competitiveness? That was what he wrote on the 2006 Boeing and Lockheed Martin arrangement. That was his argument; I do not know if you read it.

Patrick Wood: I might have at the time; I am not sure I can remember. Particularly if you are in commercial telecommunications, there is a huge driver for schedule and market pricing, which drives our thinking and drive for efficiency and may periodically get us to look at the industrial map of Europe.

Q52 **Baroness Stowell of Beeston:** I will try to be brief and I would encourage you to just stick to the headlines on this. What do you see by



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way of regulatory barriers in the UK that are specific to the UK? Is there anything about here that you would point to as a problem, or indeed that you fear might happen in the UK in the future?

Perhaps one of you can just answer this: do you see a divergence in regulatory approach in the space sector between Europe and the US? Are there different approaches going on here? If you do not think there is or you do not feel familiar, by all means say that; do not feel you have to answer it.

Patrick Wood: I will answer the US-Europe question initially. In generic terms, the FAA, CAA and regulatory entities in Europe have historically been quite aligned in terms of that, not necessarily in absolute detail, but in broad concept. Obviously, with the current global political topics, we wait to see what might happen in terms of any convergence, divergence or whatever.

Going back to your initial question about regulatory barriers, we have seen the Civil Aviation Authority go up a pretty steep learning curve with launch and satellite operators, and we understand from the industry sector that that is a very steep learning curve for a regulatory agency. We have seen a lot of focus from it to go up that learning curve.

My comment is more about engagement with industry to see what is practical or where we could help understand what practically is behind some regulation because we see some questions and regulatory comments that we struggle to understand. So it is going up a steep learning curve and we can encourage that. It is how we help it make sure that what is left as a regulatory framework is actually workable in the commercial, institutional and military space sectors.

Richard Thorburn: I shall not talk about Europe and the USA; you gave that for one of us to answer and Pat has answered for you.

Baroness Stowell of Beeston: Do you have something to say?

Richard Thorburn: No. I will quickly talk, if I may, about Thales Alenia Space in the UK. We are not an operator, so I shall not comment on regulation in that space. However, we feel there is probably a need for more regulation regarding space sustainability, most notably in avoiding space debris, which I mentioned slightly earlier. Perhaps just for completeness, there is still this report and work being done by Joanne Wheeler on the Earth Space Sustainability Initiative, which will also connect with that.

Patrick Wood: I may just make an additional comment. Something we talk a lot about is space partnerships: how do we all get together and grow the UK space sector? There is a real opportunity here between Government and the regulators, industry, academia and Ministry of Defence to really come together and look at what they need from a regulatory and insurance framework and actually work together, having a space partnership approach where we are all in this together to work out



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what is most effective, bringing expertise from our commercial, institutional and defence sectors.

Baroness Stowell of Beeston: I do not want to delay us and I am happy to move on, but it would be helpful to know this, and perhaps you could follow it up in writing. Airbus is clearly operating in the US. There is some debate about the EU space law that it is proposing to bring in and reports of concerns from the US space industry about costs of non-compliance. If you are able to give us any view as a business operating in various different territories—if we can use the word “territory” when we are talking about the space industry—it would be really helpful.

Patrick Wood: I will take that opportunity to do it as an offline written response. Thank you very much for the offer.

Baroness Stowell of Beeston: That will be really helpful.

Richard Thorburn: If I may, I will just support the secondary part of your question regarding orbital debris.

Baroness Stowell of Beeston: I am sorry; I thought you had covered that in your answer.

Richard Thorburn: Yes, but I have some statistics for you. As of January 2025, there were 29,985 registered objects in space. If we look at the data from the UK National Space Operations Centre, in January and February 2025, there were 115 uncontrolled re-entry events and 2,694 collision avoidance alerts, which is an increase of 26% over the previous year. That is why we feel it is so important for regulation in this space to be thinking sustainably. How do you make sure that, when you have finished your mission, you are no longer there, and that we can continue to have that access to space?

Lord Tarassenko: You mentioned collision tracking and avoidance as one of the areas that is growing. Now, when we had Lord Willetts come and talk to us, he said there is some capability to do that, but there is no modelling at all. With all these objects rotating in space and so on, no one has actually produced a model to show, for example if there was a collision in space and debris went off in a particular direction, what the probability of another collision, a secondary collision if you want, would be. He said that nobody has developed a capability to model. If you are tracking and looking at avoidance, is that not something that Airbus should be doing? You have some brilliant engineers who could probably do that kind of modelling.

Patrick Wood: I will partly answer that question. You are right: it is a complex model. You are talking about something that is a complex interaction of potentially two objects colliding. There was some modelling done of Cosmos and Iridium spacecraft that impacted at 90 degrees, I forget which year. I did all the press on that, so I apologise; it was at least a decade ago. There was some significant modelling, and that



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highlighted to everybody that the nature of this is quite unpredictable until you actually know the specifics of the event that you are monitoring.

As my colleague, Richard, alluded to, there is a huge number of objects and they vary in size, energy and momentum. Therefore, yes, you can do generic modelling, but when I was responsible for SSTL, we had a number of spacecraft in orbit, and you get conjunction warnings and collision warnings; the accuracy of that changes almost daily. One day, you are within several kilometres and then, the next day, the prediction is down to several hundreds of metres.

You are absolutely right: there needs to be a lot more modelling. The work of Space Command and the UK Space Agency, supported by fantastic engineers—those in Airbus and the rest of the UK space sector—is about how we predict that. But this will not come out quickly; it is a complex thing and something that we could add value to in the UK. That is for sure.

The Chair: As the prime company contractor in this space, as described, we may be putting further questions to you in writing because there are obviously going to be quite a lot that occur which you are best placed to answer in this respect. I am going to skip the national security question for now; that may be something we put to you in writing. I am going to come to Lord Tarassenko next.

Q53 Lord Tarassenko: It is a great follow-up because the modelling could be done both within Airbus and academia. Earlier, you were singing the praises of academia, but what I do not completely understand is how you work with academia. I should say I have just stepped down after 13 years on Oxford University Innovation, which is the tech transfer office of Oxford University, and we have seen large numbers of university spinouts and so on. In the 1,600 SMEs you mentioned earlier, in terms of the vibrancy of the space sector, how many of those are coming out of universities as spinouts or start-ups?

Patrick Wood: I could not give you an exact number, but it must be very significant because we see that from a number of universities. There are also organisations like Harwell, which is a research institute and behaves sometimes like academia. The last number of start-ups I heard was something like 70 just around the Harwell scientific park, which illustrates its vibrancy and capability.

I will give the speech I give a lot: industry tends to work on programmes that have a finite timescale. Something we have worked really hard on with our central head of research and development and science and technology—at multiple levels in Airbus Group, Airbus Defence and Space and Space Systems—is to develop long-term relationships with universities because otherwise, it is very short-term and project-based. For instance, we will have worked with Leicester University or RAL Space on a particular instrument, and then the teams disperse. We recognise



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that historically, we might have very deep relationships, but they then move on to the next project.

We have this structure now—as I say, we do it at Airbus Group level—because we obviously have some long-term relationships with organisations like ATI on the aerospace side. We would really encourage the equivalent in the space sector to say, “Can we have longer-term technology roadmaps which would enable longer-term relationships with academia?” When I say short-term, I mean two, three or four years, and then a team moves on to another project. I am guilty of it myself, having worked on science missions; once the project is finished, we go on to another project. We are very programme-based as an industry, so we do recognise the need for a different relationship and have strengthened that.

Lord Tarassenko: Just for clarification, you mentioned ATI; in this case that is the Aerospace Technology Institute as opposed to the Alan Turing Institute.

The Chair: Yes, you have to be careful.

Patrick Wood: Thank you for the clarification.

Lord Tarassenko: They both have the same initials. Richard, I have the same question to you.

Richard Thorburn: Thales Alenia Space has an excellent relationship with academia. We sponsor some PhD and MSc students to investigate innovative technologies and we have a close working relationship with a number of academic institutions—I can name three: Southampton, Bath and Bristol—where we work with them and they help us to develop some science instruments, so that strength of academia being played in through industry is fantastic.

Perhaps one other thing to mention is not necessarily the engagement with academia, but how we attract talent into our marketplace, which is really important. Space is very appealing, as I mentioned earlier, but Thales UK—we work in partnership with it across the UK—brought in over 100 graduates and apprentices in its most recent intake. Thales Alenia Space in the UK is a beneficiary of that community of highly skilled new entrants to the marketplace and gives them an opportunity to work on exciting projects really works for our organisation.

Q54 **Lord Lansley:** Just to follow up on precisely that point about space as an industry with a very high level of skills, of course there is a very high level of demand for skills as well. Clearly, we have recent data and indeed recent committee reports looking at skills availability to the industry, but I wondered if you could tell us something about current issues in terms of skills gaps and finding skills.

Richard Thorburn: If I may, I will continue because it is quite a neat segue from the previous question. Certainly, for us in Thales Alenia



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Space—I am sure it will also be true for Pat in his organisation—there is a very limited pool of experienced space engineers. We are looking for people emerging from universities and colleges and having an interest in space; that is quite a fertile environment for people to show interest.

Finding established space professionals in quite a limited marketplace with quite a lot of companies and a mobile workforce in the UK can be a bit of a challenge. We have been quite successful in recruiting the graduates, but we are genuinely finding difficulty for space engineers with—let us say—greater than five years' experience. That gap in demographic from graduates to those who are coming closer to retirement is a real problem, certainly in our organisation, to find those people who have that core space experience. There are great jobs in the marketplace but there is a very limited supply of candidates in the middle of their careers, so it leads to quite a competitive environment between the different businesses which makes for a bit of a challenge for us all.

Patrick Wood: Excellent answer, Richard: without putting too fine a point on it, it is about experience.

Lord Lansley: Sorry, can I just add a thought? Tell me if this is the case. There is some overlap with other industries in terms of things like software development and AI, especially as there are lots of start-ups and opportunities, and people are gravitating toward the—

Richard Thorburn: Maybe I ought to have covered that; it is in my scribbled notes underneath my typed ones. There are adjacent industries, and there are people developing in those. One challenge we have is how you develop that emerging talent into space. How do we make space attractive? I mentioned earlier those prestigious missions, and that is something that definitely lights candidates up when we talk about exciting missions to go to the moon and create a lander for the moon.

In terms of returners as well, just from personal experience, I have spent 20 years with Thales; I joined as a graduate, and I have seen people leave the organisation and then return. That is a reflection of the culture and environment we have created in Thales in the UK and Thales Alenia Space. It is incumbent upon businesses like ours to create a great place for people to come and work.

Patrick Wood: Just to add, we have done what sounds like a very similar activity, where you look at the core skills that you need. In the space world, we tend to talk about stress engineers, thermal engineers and attitude in orbit and control, but, when you break it down, you are talking about things like high-speed digital electronics and real-time embedded software. It is about having a more detailed exchange where people may not have thought about space as a career, and we may traditionally have been advertising a different job title, but we need to be more generic in the job title we are advertising. It came across when we were thinking about quantum and AI, and how we attract people from potentially other sectors; actually, it is the core engineering skills



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because we can do the training, add the additional training, or ensure that that happens.

Similarly, we do not actually have an issue with attracting the very early careers. Just to give you one piece of it, in Airbus Defence and Space, there were 4,689 applications for 36 positions in our early careers, just in one particular grade. We look for graduates and apprentices that are level 2—craft apprentices—level 3, level 4 and degree level.

The front-end entry is really healthy. At least space has the advantage that people like it as a concept to go into, but that is also true because companies like us do a lot of STEM—science, technology, engineering and maths. I have been a STEM ambassador in the past. We have something like 30 STEM ambassadors on all our sites, and that is taking the message out not just about space but the core engineering skills. Exactly as my colleague, Richard, alluded to, it is those people with more than five years' experience who we are very short of in the UK.

The Chair: We have about five minutes left. You have indulged us with your time, and we have probably got a vote coming up again very shortly. I am going to ask Viscount Stansgate to ask his question on defence, security, et cetera, as quickly as he can, and for your answers to be bite-sized. There is one more very short question after that.

Q55 **Viscount Stansgate:** I am sorry about this; it is very disruptive to have votes both for us and for you. In what ways do your companies contribute to national security? In what we all know is a changing global environment, how would you predict that your defence, security and resilience operations may change in the future?

Patrick Wood: This is very significant. If I quote one adjacent area, we grow the purest crystal quartz in the world for a particular strategic defence reason, which I cannot go into. We do everything from that perspective, which is almost a scientific activity. Clearly, we have had the heritage in the military satellite telecommunications. We go back pre-Skynet 4. We have done all the Skynet 4, Skynet 5 and Skynet 6 satellites and are looking into the future.

That is not just about building it; it is about understanding the resilience, the nuclear hardening, the secure TT&C—telemetry, tracking and command—having engineers who are experts in hardened, resilient spacecraft, and then taking that expertise and using it in different orbits. We now have the missions that we are building for Space Command and other MoD customers in the low earth orbit. Again we are taking our knowledge from higher orbits and applying it, so we go through the full spectrum of defence.

In our European space systems company, we can pull on expertise—everything from ballistic missile experience all the way through to high-precision, rendezvous and dock, robotics, advanced high-precision attitude and orbit control, lasers, and unusual sensors that work and



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have a dual use. As a company, we talk about the fact we have the sovereign capability of the UK, and we mean it. Behind the gates at Airbus UK, we have the ability to build resilient UK telecommunications satellites that are military grade.

Viscount Stansgate: Would you predict that dual-use technology will have an increasing purpose?

Patrick Wood: If I look at the digital signal processor that we fly on current UK military satellite, that started in the commercial world as ESA research. We compartmentalised the research so we could do part of it in European Space Agency, and we actually did part of it with Kinetic; that shows how long ago it started. We have effectively isolated that technology so we can either use it in the military or commercial domain. We now have the most advanced digital signal processor that is flying in GEO telecommunications in GEO orbit anywhere in the world.

We also have the same capability in the military domain. We use it for a slightly different purpose: to produce a very sophisticated anti-jam antenna, which has actually demonstrated its resilience through the life of Skynet 5. Even when our friendly forces have tried to jam and compromise it, it has actually survived. UK technology is fantastic in this area.

Richard Thorburn: I have three points for you. Thales Alenia Space provides sovereign SATCOM capability for European nations. We will bid for future activities where the opportunity exists. Dual use was already mentioned, and perhaps I will also mention that propulsion enables all those missions to happen, which is something we can do in Northern Ireland.

Q56 **The Chair:** I have one final question. If you could make one recommendation on space policy in the UK, what would it be and why?

Patrick Wood: This is a slightly different answer, I guess. In space policy terms, it is about what the priorities are for the UK and the need to articulate those. Turning those into policy is something that needs to be thought about but, to start with, what are the areas that we really need to address? It is likely to be space sustainability, which was talked about, and the use of in-orbit servicing and manufacturing—those types of areas. I am trying to keep my answer short; I apologise.

The Chair: No, that is appreciated.

Richard Thorburn: First, it has been a privilege to present to you today alongside Pat from Airbus. You may have heard us refer to one another as colleagues, as we are all colleagues in the space sector.

If there was one recommendation, it would be to prioritise a small number of fully funded UK national missions. If you can help us to have that clarity on the big bets that the Government are really pushing—I think that was the phrase that was used earlier—that will not only



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position the UK space sector on the world stage, but allow the industry to adapt and deliver the right solutions into the marketplace that support the UK national interest.

The Chair: You have both been extremely generous with your time and it has been extremely informative. Thank you very much indeed, and I apologise for all the interruptions, which were entirely beyond our control, sadly. The public evidence session is now concluded.