



BRIEFING PAPER

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Outer space

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Summary

On 13 December 2015, the Government published a National Space Policy which supports the Government's new investments in areas such as human spaceflight and microgravity research as space becomes "an increasingly essential part of our daily lives and a huge success story for the UK."

The policy serves as an articulation of government support for a sector that is worth £11.8 billion to the economy and supports a range of public services from disaster relief, defence and transport. The Government also rehearses its commitment to growing the UK's commercial space sector – with an ambition to capture 10% of the global market supporting 100,000 new jobs and generating £40bn for the economy by 2030.

According to the Parliamentary Office of Science and Technology (POST) some of the key issues facing the commercial space sector are: the regulatory regime governing outer space, notably in respect of a future spaceport; the development of small satellites, an area of particular strength in the UK; insurance requirements and other structural and international factors. Understanding these issues requires an appreciation of the national and international legal framework governing the exploitation and exploration of outer space. The lead role of the UK Space Agency, not least in administering the licensing regime for outer space activities, will remain central to the development of UK capabilities.

The UK's new National Space Policy commits to four key principles in the Government's use of space. The Government:

- recognises that space is of strategic importance to the UK because of the value that space programmes deliver back to public services, national security, science and innovation and the economy
- commits to preserving and promoting the safety and security of the unique space operating environment, free from interference
- supports the growth of a robust and competitive commercial space sector, underpinned by excellent academic research
- commits to cooperating internationally to create the legal frameworks for the responsible use of space and to collaborating with other nations to deliver maximum benefit from UK investment in space

Against this background, the House of Commons Science and Technology Committee launched an inquiry into satellites and space, to inform the Government's UK civil space strategy, originally planned for 2016. Satellite technology is one of the 'Eight Great Technologies' identified in 2013 by the Government for public support.

On the 21 February 2017, the Government published a Draft Spaceflight Bill to "provide for the creation of a regulatory framework to enable commercial spaceflight activities to be carried out from spaceports in the United Kingdom". This changes earlier plans to introduce such provisions as part of a wider Modern Transport Bill. The House of Commons Science and Technology Committee will be examining the Draft Bill, and has issued a call for written evidence by 20 March.

1. Regulatory framework

1.1 Outer Space Act

The 1967 UN Outer Space Treaty places an obligation on Governments to:

- i) maintain a register of objects sent into space;
- ii) ensure safety of operations for such space activities;
- iii) bear ultimate liability for costs arising from accidental damage to 3rd parties from UK space activities.

Many countries have reflected their obligations under the Outer Space Treaties through the enactment of national legislation. The Outer Space Act 1986 (OSA) is the legal basis for the regulation of activities in outer space (including the launch and operation of space objects) carried out by persons connected with the United Kingdom. The Act confers licensing and other powers on the Secretary of State acting through the UK Space Agency. The Act ensures compliance with UK obligations under the international conventions covering the use of outer space.

The UK Outer Space Act 1986 ("the OSA"), provides the legal framework to fulfil these obligations and places a requirement on any UK organisation or individual launching or procuring a launch of and / or operating space objects in space to obtain a licence. Key points of licensing under the OSA are:

- ensuring the financial health of licence applicants;
- ensuring that the activity does not pose risks to public health and safety or UK national security;
- an indemnity from the licensee to the Government against any proven 3rd party costs resulting from the activities;
- to help manage this indemnity, 3rd party liability insurance both during the launch and while the satellite is in operation.

1.2 Deregulation Act

[Section 12 of the Deregulation Act 2015](#) amended the Outer Space Act in relation to indemnity limits on activity in outer space. This came into force on 1 October 2015. From this date, a risk assessment will be performed for each new licence application to consider the potential risks posed by the mission and an appropriate liability cap will be determined (which will be set out in the licence, if granted). It is anticipated that, in the majority of cases, which involve single satellite missions employing established launchers, satellite platforms and operational profiles, the cap will be set at €60 million (Euro).

A liability cap will not automatically apply to existing licensees. However, from 1 October 2015 existing licensees may write to the UK Space Agency and ask for a cap to be applied to their licensed mission. Each request will be assessed and notice of the decision will be given in writing.

Some background on the 2015 Act was given by the then Parliamentary Under-Secretary of State, Department for Environment, Food and Rural Affairs (Lord De Mauley) during a committee stage debate on the presaging Bill:

The Outer Space Act 1986 is the legal basis for the regulation of activities in outer space carried out by organisations or individuals established in the United Kingdom, its Crown dependencies and certain Overseas Territories. The aim of the Outer Space Act and its licensing regime is to ensure compliance with the United Kingdom's obligations under international treaties covering the use of outer space. One of these is the liability convention, under which the UK Government are ultimately liable for third-party costs for accidental damage arising from UK space activities. Section 10 of the Outer Space Act 1986 requires licensees to indemnify the Government against liabilities resulting from their space activities. This is an unlimited liability on licensees.

Since it is not possible to insure against unlimited liability, there is a requirement on licensees to obtain third-party liability insurance, usually to a minimum of €60 million for the duration of the licensed activity, with the UK Government a named beneficiary. If a claim were to exceed that amount, the Government could seek to recover the remainder under Section 10 of the Act.

As the noble Lord said, UK space operators have long argued that the unlimited liability placed on them is very difficult to manage in terms of financing. Furthermore, they say that licence conditions relating to insurance place them at a significant disadvantage. Given the global nature of the space industry, this could result in work being lost to countries outside the UK, in particular to countries where operators may not be subject to unlimited liability, such as the USA or France.¹

1.3 International factors

General

Some context is provided by the following passage from the UK Government's [National Space Security Policy](#) (April 2014):

The cornerstone of international space law is the 1967 [Outer Space Treaty](#). It declares space to be the province of all mankind, free for exploration and use by all nations, and places international responsibility on the state for its national space activities, as well as liability on the launching state for any damage caused by space objects. The international legal framework has continued to develop, but space remains lightly regulated. The consequences of strategic or operational misunderstandings between states in space could be very grave. It is important that we achieve broad international agreement on sustainable, peaceful, safe and secure activities in space – just as we do at sea or in the air. The potential for different interpretations of some aspects of space law also exposes commercial and civil users – and the manufacturers, operators, service providers, underwriters or financiers who support them – to risks and uncertainties which may act as a barrier to progress. The United Kingdom supports

¹ HL Deb 28 October 2014 c GC370

efforts to reinforce the safety and security of the space environment, for states and other civil or commercial users.

In addition to the 1967 Treaty, international space law is underpinned by the following instruments, negotiated in the UN Committee on the Peaceful Uses of Outer Space:

- 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space
- 1972 Convention on International Liability for Damage Caused by Space Objects
- 1976 Convention on Registration of Objects Launched into Outer Space
- 1979 Moon Agreement

USA

The US Commercial Space Launch Competitiveness Act- H.R.2262 (known as the Space Act of 2015) was, on 25 November 2015, signed into law by President Obama. Among other things, this law recognises the right of US citizens to own asteroid resources they obtain and encourages the commercial exploration and utilisation of resources from asteroids.² According to an article in *Petroleum Review* (December 2016 / January 2017) the USA is the only country in the World whose citizens have property rights in outer space recognised by their nation, although Luxembourg is cited as an example of another country considering bestowing similar rights.³

Although opening space up to commercial resource exploitation could fuel technological development in a new space race, the Space Act 2015 has attracted controversy. The United States, like the UK, France and Russia, is a signatory of the 1967 Outer Space Treaty, which reads:

Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.

Further, the US Space Act asserts that "the United States does not thereby assert sovereignty or sovereign or exclusive rights or jurisdiction over, or the ownership of, any celestial body."

According to an article in the *Conversation*,⁴ the US Space Act 2015 represents "a full-frontal attack on settled principles of space law which are based on two basic principles: the right of states to scientific exploration of outer space and its celestial bodies and the prevention of unilateral and unbridled commercial exploitation of outer-space resources." These principles are found in agreements including the [Outer Space Treaty of 1967](#) and the [Moon Agreement of 1979](#). The Moon Agreement (1979) has in effect forbidden states to conduct commercial mining on planets and asteroids until there is an

² <http://globalriskinsights.com/2015/12/space-act-could-open-door-to-multi-trillion-dollar-industry/>

³ "Fuel for thought", *Petroleum Review*, December 2016 / January 2017 pp 22-4

⁴ The Conversation, "[Who owns space? US asteroid-mining act is dangerous and potentially illegal](#)", 25 November 2015

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international regime for such exploitation. While the US has refused to sign up to this, it is binding as customary international law. The latter could, of course, be renegotiated and will doubtless be a feature of ongoing discussions.⁵

⁵ "Fuel for thought", *Petroleum Review*, December 2016 / January 2017 pp 22-4

2. Space organisations

2.1 Overview

In the UK, 17 different government organisations are involved with space. These include several government departments, research councils, Innovate UK (formerly the Technology Strategy Board) and the UK Space Agency.⁶

Leading the UK's space policy is the UK Space Agency, an executive agency sponsored by the Department for Business, Energy & Industrial Strategy (BEIS), which is responsible for all strategic decisions on the UK's civil space programme.

To drive the development of new, innovative services, the Government, through Innovate UK, funded the establishment of the Satellite Applications Catapult (SAC), in May 2013.

The [Satellite Applications Catapult](#) is an independent innovation and technology company, created to foster growth across the economy through the exploitation of space. It helps organisations make use of and benefit from satellite technologies, and bring together multi-disciplinary teams to generate ideas and solutions in an open innovation environment.

Based in Harwell, near Didcot, the Catapult is one of a network of centres to accelerate the take-up of emerging technologies and drive economic growth. It is a not-for-profit research organisation which is registered as a private company limited by guarantee and controlled by its Board.

In addition to companies that make up the aerospace industry, relevant organisations include universities and the research councils that fund them. The largest university-based space science institute in the UK is the Mullard Space Science Laboratory, University College London which has flown about 40 instruments on international spacecraft.

2.2 UK Space Agency

The [UK Space Agency](#) was launched in March 2010 and became a full executive agency on 1 April 2011 when responsibility for the majority of civil space activities was transferred from Department for Transport, the Research Councils and the Technology Strategy Board. The Agency's mandate is to provide strategic leadership to the UK's civil space activity with a central focus on the growth of the industrial sector, working in partnership with other actors where appropriate. For 2015/16, the UK Space Agency's funding allocations – specified as departmental expenditure limits within the BIS (now BEIS) science budget – are £170.2 million (resource) and £166.1 million (capital).⁷ The UK Space Agency's [2016-17 corporate plan](#) anticipates expenditure of £377.5 million in

⁶ HM Government, [National Space Policy](#), 13 December 2015

⁷ [BIS written evidence](#) to the House of Commons Science and Technology Committee, September 2015

2016/17, £283.6 million of which is earmarked for international subscriptions.⁸

A [2013 report](#) by the House of Commons Science and Technology Committee into the Work of the European and UK space agencies noted that the UK Space Agency is relatively small compared with other European space nations. In 2013 the UK agency had 44 staff based in Swindon. By contrast, France's CNES had 2,400 staff, Germany's DLR had 230 (with 1,000 more within its research teams) and Italy's ASI had 250 staff. The UK Space Agency is currently made up of about 70 staff based in Swindon, London and the UK Space Gateway in Oxfordshire.⁹

The UK Space Agency is responsible for ensuring that the UK retains and grows a strategic capability in the space-based systems, technologies, science and applications. It leads the UK's civil space programme, and is responsible for all strategic decisions.

The Agency has three core functions:

- Funding and delivery of civil space projects and downstream space related activities nationally, bilaterally and via the European Space Agency;
- Development of policy including advice to Ministers and oversight of EU space policies (e.g. EU space industrial policy), EU programmes (e.g. Galileo, Copernicus, Horizon 2020), and representing the UK in the United Nations on space matters; and
- Regulation of UK space activities to meet international obligations including licensing of UK-based satellite operators.

David Parker, then Chief Executive,¹⁰ UK Space Agency, gave the following evidence to the House of Commons Science and Technology Committee on 10 July 2013:

The regulatory environment and role of the agency is very important because it has a responsibility to implement obligations that the UK has taken on under the Outer Space Treaty. That means our obligations are implemented through the so-called Outer Space Act 1986. We take that very seriously in terms of issuing licences for operators and people who are going to launch things and use things in space. The dangers of a failure of a space system are very great with potential damage to the space environment. We take the regulatory responsibilities very seriously and assess all people who are looking to put things into space. Where there are start-up organisations—I will not name names—we take companies through the process and help them, because it comes as a surprise that they need to provide technical information but also financial evidence of their strength before I sign the licence on behalf of the Secretary of State. The required commitments are all very serious in that sense.¹¹

⁸ Further information on UKSA funding is available in a parliamentary written answer, PQ 50920 [on Space Technology: Expenditure], 7 November 2016

⁹ <https://www.gov.uk/government/organisations/uk-space-agency/about>

¹⁰ Katherine Courtney succeeded David Parker as interim Chief Executive in April 2016. Graham Turnock will be the new Chief Executive from 1 April 2017.

¹¹ House of Commons Science and Technology Committee - Fourth Report, [Work of the European and UK Space Agencies](#), HC 253, 28 October 2013, Q151

2.3 European Space Agency

The European Space Agency (ESA) is an international organisation with [22 Member States](#). The full members are: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland and the United Kingdom. Slovenia is an Associate Member. Canada takes part in some projects under a cooperation agreement. Bulgaria, Cyprus, Malta, Latvia, Lithuania and Slovakia have cooperation agreements with ESA. Discussions are under way with Croatia.

[ESA's mission](#) is 'to shape the development of Europe's space capability and ensure that investment in space continues to deliver benefits to the citizens of Europe and the world'. [ESA's purpose](#) is 'to provide for, and to promote, for exclusively peaceful purposes, cooperation among European States in space research and technology and their space applications, with a view to their being used for scientific purposes and for operational space applications systems.'

ESA remains the primary route for UK Government Research and Development investment in space, with the UK contributing directly to the ESA. In response to a PQ,¹² the then Minister, David Willetts, gave the following breakdown of UK funding to the ESA in May 2014:

Direct UK funding of the European Space Agency (ESA) has been as follows:

	£ million
2009/10	242.8
2010/11	231.1
2011/12	232.0
2012/13	207.6
2013/14	267.5

In addition, the Minister also noted that national expenditure averaging £20 million a year has been expended within the UK to build and operate scientific instruments carried on spacecraft of ESA. More recently, the Government told the House of Commons Science and Technology Committee:

In addition to investing through the European Space Agency, the Government maintains a National Space Programme, the budget

¹² HC Deb 8 May 2014 c 253W

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for which has grown from around £20million per year to £88million per year over the past five years.¹³

Funding to ESA has been used to contribute to missions and technology in a wide variety of fields: Earth observation for science and applications, telecommunications and broadband delivery, access to microgravity facilities for life and physical sciences, space weather, navigation technologies, human spaceflight and weather monitoring.¹⁴

The House of Commons Science and Technology Committee's [2013 report](#) also concluded that the UK secures a demonstrable return on its investment in ESA. However, it also noted that unlike France, Germany and Italy, it has few nationals working in senior positions for the organisation. The Committee felt this may be problematic in terms of the UK's overall position and influence in ESA, despite its strong financial commitments.

¹³ House of Commons Science and Technology Committee, *Satellites and space: Government Response to the Committee's Third Report of Session 2016-17*, HC 830

¹⁴ HC Deb 8 May 2014 c 253W

3. Licensing

An Outer Space Act licence, administered by the UK Space Agency, provides that licensees are obliged to:

- permit reasonable access to documents and inspection and testing of equipment and facilities by UK Space Agency or their advisors as appropriate
- inform UK Space Agency of any change in the licensed activity (e.g. change of orbit, change of owner) and seek approval prior to the change being made
- prevent contamination of outer space and adverse changes in the environment of the Earth
- avoid interference in the space activities of others
- avoid any breach of the UK's international obligations
- preserve the national security of the UK
- insure themselves against third party liabilities (usually 60 million euro) arising from the licensed activity - the UK government should be named as an additional insured and insurance should be for the launch and in-orbit phases of the mission
- for each licence application, a risk assessment will be performed to consider the potential risks posed by the mission and a commensurate level of insurance cover will be determined
- in the majority of cases, involving single satellite missions employing established launchers, satellite platforms and operational profiles, this insurance cover would be limited to 60 million euro
- dispose of the licensed space object appropriately at the end of the licensed activity and inform UK Space Agency of the disposal and termination of the activity

Further information, including a copy of the Act and a sample licence, is available from the Gov.uk website from which the above information is taken.¹⁵

The licensing system includes a technical review of the launch and operation of a satellite. This is aimed at informing the Government of any undue risks concerned with the mission. This information is used to facilitate the decision on whether or not to grant a licence or whether it should be granted subject to certain conditions. As part of its review of the OSA licensing system, the UK Space Agency (previously the British National Space Centre) introduced improved assessments of collision risk in-orbit and for the satellite's transfer from the launch vehicle to its final working orbit. These upgraded assessments are accompanied by a deeper analysis of the design of the satellite and launcher and of safety measures in place during the mission.

¹⁵ <https://www.gov.uk/guidance/apply-for-a-license-under-the-outer-space-act-1986>

4. Strategy and policy

Outer space did not receive a mention in the Conservative Party manifesto for 2015. However, the deregulation measures mentioned above were alluded to in a recent PQ on space:

Space Technology: Written question – 1476

Asked by [Mr Iain Wright](#) (Hartlepool)

Asked on: 08 June 2015

Department for Business, Innovation and Skills

To ask the Secretary of State for Business, Innovation and Skills, what his policy is on future government support for the UK space sector.

Answered by: [Joseph Johnson](#)

Answered on: 11 June 2015

The UK has a thriving space sector worth £11.3b to the economy and satellites have been acknowledged as one of the UK's Eight Great technologies, fundamental to our future economy. The UK's Civil Space Strategy, 2012 to 2016, will continue to guide policy in line with the goal of space contributing £40 billion a year to the UK economy by 2030.

As part of the Deregulation Bill, reforms to the existing Outer Space Act will come into force in October - reducing the burden on satellite operators, making the UK more competitive globally, particularly building on our expertise in small satellites. This continued growth is enabled by balanced investment in national and European space programmes.

At the European Space Agency's Council of Ministers in December 2014, we committed additional investment of more than £200 million in Europe's space programme, enabling the UK to further collaborate with Europe and develop world leading technologies, services and science missions. While individual opportunities will continue to be evaluated on their own merit, our broad policy goals remain: economic growth, scientific excellence and maximum benefit to citizens.

Working across government is central to achieving these aims. For example, the UK Space Agency jointly published the National Space Security Policy in April 2014 with the Cabinet Office, Ministry of Defence and Foreign Office, to set out a coherent approach to the UK's space security interests, and the publication of a National Space Policy later this year will spell out the principles which underpin the UK approach to space.

The Space Innovation and Growth Strategy (IGS) was conceived in 2010 to create a partnership between industry, government and academia to develop, grow and exploit new space related opportunities.

Space technologies also have a wide range of productivity-enhancing effects on other sectors. The IGS maintains its target of achieving 10% of the global space market, which is estimated to be £400 billion by 2030. An [update report](#) (14 July 2015) on the Space Innovation and Growth strategy summarises the IGS achievements since 2010 and outlines the plans for the next phase of the programme.

On 13 December 2015, the Government published a National Space Policy which supports the Government's new investments in areas such as human spaceflight and microgravity research as space becomes "an increasingly essential part of our daily lives and a huge success story for the UK. UK projects are already leading the world in issues like monitoring and combatting climate change and supporting developing nations."¹⁶

The NSP commits to four key principles in the government's use of space. The Government:

- recognises that space is of strategic importance to the UK because of the value that space programmes deliver back to public services, national security, science and innovation and the economy
- commits to preserving and promoting the safety and security of the unique space operating environment, free from interference
- supports the growth of a robust and competitive commercial space sector, underpinned by excellent academic research
- commits to cooperating internationally to create the legal frameworks for the responsible use of space and to collaborating with other nations to deliver maximum benefit from UK investment in space

¹⁶ HM Government, [National Space Policy](#), 13 December 2015

5. Space missions and technologies

5.1 Missions

The UK Space Agency's website contains [a full list](#) of the space exploration and space missions which the agency currently invests in. These range from monitoring and studying the solar system to robotic and manned space flights. The majority of UK participation in these programmes is through its investment in the European Space Agency. Some of the current missions with UK involvement include:

- **BepiColombo**, originally due for launch in July 2016,¹⁷ will be the third spacecraft to visit Mercury. It will take six years for it to reach the planet, and much of the spacecraft will be built in Britain in partnership with several UK science teams. The UK's involvement in BepiColombo is funded by the UK Space Agency.
- **Euclid** is a high-precision survey mission to map the geometry of the Dark Universe and would effectively look back in time about 10 billion years, covering the period over which dark energy seems to have accelerated the expansion of the Universe. UK involvement includes nine UK institutes involved in instrument development or data processing / analysis activities. Funding is also provided by the UK Space Agency.
- The **Gaia** spacecraft will survey more than one billion stars to make the largest, most precise map of our Galaxy to date. Gaia is one of the most important current space projects for the UK, which has won about €80M of contracts from ESA (European Space Agency) to build the spacecraft.

A recent high profile example was the Rosetta cometary mission; its lander, called Philae, touched down on the surface of Comet 67P Churyumov-Gerasimenko on 12 November 2014.¹⁸

UK astronaut Tim Peake's mission to the International Space Station, called 'Principia' launched on 15 December 2015. The mission used the unique environment of space to run experiments as well as trying out new technologies for future human exploration missions. Tim Peake is the first British ESA astronaut to visit the Space Station where he spent six months as part of the international crew.¹⁹ On 26 January 2017, the Business Secretary Greg Clark confirmed that Tim Peake will make a second mission to the International Space Station to continue work on scientific research and broadening our understanding of the space environment.²⁰

¹⁷ The launch has since been [postponed](#) to October 2018

¹⁸ http://www.esa.int/Education/Teach_with_Rosetta/Rosetta_timeline

¹⁹ <https://principia.org.uk/the-mission/>

²⁰ BEIS Press release, [Boost for UK space sector as European Space Agency plans second Tim Peake space mission](#), 26 January 2017

5.2 Commercial space activities

On 15 December 2015, the Parliamentary Office of Science and Technology (POST) published a paper, [UK Commercial Space Activities](#). This provides a comprehensive overview of the work of the civil space sector and the issues that confront it. Among the key issues is the potentially lucrative satellite market, including small satellites. One type of miniaturized satellite are the so-called 'CubeSats', discussed in the POST note.

As noted above, to protect against international liability for damages caused by UK-owned space objects all UK operators must obtain a licence from the UK Space Agency along with 3rd party insurance (to a minimum of €60 million). There are concerns that insurance requirements in the UK hinder the growth of its small-satellite industry, given that the costs of insuring such a satellite could dwarf what the satellite is actually worth.

The POST paper also contains some useful headlines on the value of the commercial space sector and on future developments involving spaceplanes:

The UK space industry had a turnover of £11.8bn in 2012/13. By 2030, the UK Government and industry want this to grow to £40bn.

Government and industry want the UK space industry to capture 10% of the global space economy by 2030.

The Government is developing a regulatory regime that will permit the creation of a commercial spaceport in the UK by 2018.

More details on the spaceport development in the UK has been published on the Gov.uk website.²¹

As recently as 1 December 2016, the Minister of State at the Department of Transport (John Hayes) referred to spaceport-related work in a forthcoming Modern Transport Bill:

The Government is working on measures for inclusion in the Modern Transport Bill that will create the legal basis for the licensing of spaceports and the conducting of commercial spaceflight operations in the UK. This will help to grow our national, space-related economy, and bring benefits to local industries involved in spaceport activity, such as construction and tourism – supporting this Government's strategy for delivering jobs and economic growth to every community and corner of the country.²²

This work has since been moved to a Draft Spaceflight Bill, discussed later in this briefing paper.

²¹ Department for Transport, UK Space Agency, Civil Aviation Authority and Department for Business, Innovation & Skills, [Spaceport: briefing on emerging requirements](#), 15 December 2015

²² PQ 54450 [on Space Technology], 1 December 2016

6. Select Committee inquiry

Following the Government's publication of its National Space Policy, House of Commons Science and Technology Committee launched an inquiry into Satellites and space, to inform the Government's promised UK civil space strategy in 2016. Announcing its inquiry, the Committee also observed that satellite technology is one of the 'Eight Great Technologies' identified by the Government in 2013. The inquiry was launched on 16 December 2015, the day after Major Tim Peake became the first UK astronaut to join the International Space Station.

The Committee invited written submissions by Friday 29 January 2016 on the National Space Policy and the following issues:

- What satellite-based capabilities should the Government particularly support — telecommunications, navigation, earth observation, space science, or others — and how?
- What steps should the Government be taking to build markets for both new satellites and the 'space services' that they provide (such as space-based internet services or high resolution imaging)?
- What is the impact of the current UK regulatory environment on growth in the satellites and space sector? Is it conducive to new players, such as SMEs and start-ups, entering the market? Has the regulatory environment kept pace with innovations in satellite/space technologies?
- What mechanisms are needed to encourage investment in UK space and satellite technology, and improve access to finance?
- Is the Government striking the right balance between national and European/international endeavour?
- What are the key challenges facing the Government and industry in developing and implementing new space capabilities and services? What are the technical barriers to further growth in the sector, including the lack of a UK launch capacity?

The Committee published its report, *Satellites and space*,²³ on 15 June 2016, with the Government responding some five months later.²⁴ In response to a Committee recommendation on the forthcoming Civil Space Strategy, the Government stated that it was in the process of developing what it called its "new Space Growth Strategy" which will set out how the principles of the National Space Policy would be put into action. The Government also stated that "the UK will continue to be a member of the European Space Agency after the UK leaves the European Union."

The Committee's report also articulated many of the space industry's concerns about an overly complex satellite licensing regime and the financial burden imposed by insurance requirements imposed on operators. In its response the Government raised the possibility of

²³ House of Commons Science and Technology Committee, *Satellites and space*, Third Report of Session 2016-17, HC 160

²⁴ House of Commons Science and Technology Committee, *Satellites and space: Government Response to the Committee's Third Report of Session 2016-17*, HC 830

waiving insurance requirements for the operational phase of certain low risk missions.

A Key Committee recommendation on proposals for a UK Spaceport is reproduced below, together with the Government response:

Report recommendation

Through its promotion of the establishment of a UK Spaceport by 2018, the Government has placed the UK in a prime position to take advantage of the next leap forward in space technology—the development of re-usable, commercial spaceplanes. The focus on a horizontal-only launch capacity, however, may be too narrow and risk limiting the use and value of a UK spaceport to the industry. (Paragraph 35).

Before publishing its final ‘technical requirements’ for a UK spaceport, we recommend that the Government sets out the rationale, with supporting evidence, for limiting the scope of the proposed spaceport to accommodating only the horizontal launch of suborbital flights. The Government should also explain how it is ensuring that the spaceport plans will be further refined to meet the needs of UK space and satellite businesses, and what it will do to ensure that the proposal attracts the necessary private investment. (Paragraph 36)

Government response

The Government intends to establish the UK as the European hub for low cost launch of small satellites. In parallel, we are supporting the development of the separate emerging market for sub-orbital flights. If we move quickly, we have the opportunity to be the first to provide both. The Government recognises that it must clearly set out the action plan to capture these new markets for the UK we are already examining the case for both horizontal launch and vertical launch options for small satellite launches. The Modern Transport Bill will contain legislation to allow for a variety of launch options, including horizontal, vertical and single-stage-to-orbit systems. The Government plans to introduce safe and practical regulation, together with access to launch ranges, at competitive pricing that will attract commercial operators.

7. Draft Spaceflight Bill

On 9 February 2017, the Secretary of State for Transport (Chris Grayling) announced forthcoming legislation on spaceflight in the following short written statement:

We intend to publish a draft spaceflight Bill later this month, dedicated to commercial spaceflight in the UK. This legislation will be fundamental to enabling small satellite launches and sub-orbital flights from the UK, ensuring the UK is well placed to take advantage of a growing global market. The Government's intention is to introduce this Bill formally early in the next Session, following a period of scrutiny and engagement with industry and other interest groups.

The space sector is vital to the future of the UK economy, with a strong record of creating high-value jobs and generating wealth across the country. To help the creation of the space launch market in the UK, the UK Space Agency is inviting commercial space consortia to apply for grant funding to take the action that will make our ambitions a reality.

Together, the proposed legislation and grant funding announced today will have the potential to enable commercial spaceflight from a UK spaceport by 2020

The Draft Spaceflight Bill was subsequently published on 21 February, prompting the House of Commons Science and Technology Committee to issue a [call for written evidence](#) in support of pre-legislative scrutiny. A day later, the Government published a Vehicle Technology and Aviation Bill, which includes all those provisions which were originally intended for a Modern Transport Bill (which would also have included spaceflight). The Government's goal is now to introduce legislation on spaceflight early in third session of the current Parliament.

In a [letter to the Chair of the Science and Technology Committee](#), the Government explained the need for speed and also outlined the main provisions of the Draft Bill:

There is some urgency to do this. We have the opportunity to secure first mover advantage over potential European competitors. For the UK to seize this opportunity to grow our share of the global commercial space market to 10% by 2030, and to become the first launch country in Europe, it is imperative that these measures are introduced to this timescale. We face four strong competitors – Portugal, Sweden, Italy and Norway are also planning space port development and industry are speaking to all of these countries.

The draft Bill aims to establish an enabling regulatory framework to support industrial development whilst safeguarding the general public and mitigating government risks. The principal provisions in the Bill cover:

- the duties of the regulator to secure public safety whilst taking into account the interests of third parties, licencees, the environment, national security and the UK's international obligations;

A planned Modern Transport Bill has now been separated into a Vehicle Technology and Aviation Bill and the Draft Spaceflight Bill

- the principle that any of the activities in the Bill are prohibited unless they are either conducted under licence or under a relevant exemption;
- the concept of a range, or zone, that can be kept clear for the purposes of spaceflight activities;
- the licensing regime, to include the need for operators to manage risks to a standard that is as low as reasonably practicable. This follows current practice for the Health and Safety Executive but allows us to define what this entails in regulation;
- the requirements for participants in spaceflight activities to consent to accepting the risks that come with those activities, and prohibit licence holders from allowing individuals to participate in such activities without that consent. These clauses also set requirements for the training, qualifications and medical fitness that need to be met both by staff and paying participants;
- the Safety, security, and accident investigation rights of regulatory authorities of licensed activities, and the tools that may be set in place to enable them to do this. The draft Bill also includes in its later sections provisions on liability, insurance and for a new charging model for licensing;
- and finally, the way in which Government can enter into agreements with other countries to recognise existing regulatory or licensing provisions made by them.

Clause 3 of the Draft Bill provides for the licensing of both spaceflight activities in the United Kingdom and the operation of a UK spaceport. The Outer Space Act 1986 will continue to apply to other (outside the UK) activities involving:

- launching or procuring the launch of a space object;
- operating a space object;
- any activity in outer space.

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