



House of Commons
Science and Technology
Committee

The Draft Spaceflight Bill

Fourteenth Report of Session 2016–17

*Report, together with formal minutes relating
to the report*

*Ordered by the House of Commons
to be printed 26 April 2017*

Science and Technology Committee

The Science and Technology Committee is appointed by the House of Commons to examine the expenditure, administration and policy of the Government Office for Science and associated public bodies.

Current membership

[Stephen Metcalfe MP](#) (Conservative, South Basildon and East Thurrock) (Chair)

[Victoria Borwick MP](#) (Conservative, Kensington)

[Stella Creasy MP](#) (Labour (Co-op), Walthamstow)

[Jim Dowd MP](#) (Labour, Lewisham West and Penge)

[Chris Green MP](#) (Conservative, Bolton West)

[Dr Tania Mathias MP](#) (Conservative, Twickenham)

[Carol Monaghan MP](#) (Scottish National Party, Glasgow North West)

[Gareth Snell MP](#) (Labour (Co-op), Stoke-on-Trent Central)

[Graham Stringer MP](#) (Labour, Blackley and Broughton)

[Derek Thomas MP](#) (Conservative, St Ives)

[Matt Warman MP](#) (Conservative, Boston and Skegness)

Powers

The Committee is one of the departmental select committees, the powers of which are set out in House of Commons Standing Orders, principally in SO No 152. These are available on the internet via www.parliament.uk.

Publication

Committee reports are published on the Committee's website at www.parliament.uk/science and in print by Order of the House.

Evidence relating to this report is published on the relevant [inquiry page](#) of the Committee's website.

Committee staff

The current staff of the Committee are: Simon Fiander (Clerk); Marsha David (Second Clerk); Sean Kinsey (Second Clerk); Dr Elizabeth Rough (Committee Specialist); Martin Smith (Committee Specialist); Sonia Draper (Senior Committee Assistant); Julie Storey (Committee Assistant); and Shagufta Hailes (Media Officer).

Other staff during the inquiry: Howard Daley (Legal Specialist, House of Commons Scrutiny Unit)

Contacts

All correspondence should be addressed to the Clerk of the Science and Technology Committee, House of Commons, London SW1A 0AA. The telephone number for general inquiries is: 020 7219 2793; the Committee's e-mail address is: scitechcom@parliament.uk.

Contents

Summary	3
1 Introduction	4
Background	4
Purpose of the Spaceflight Bill	5
Our inquiry	5
A note on terminology	6
2 Establishing a UK launch capacity	8
Establishing a UK launch capacity: the current challenges	8
Securing an operator	9
Export controls	10
3 Licensing	12
Setting licence conditions	14
Regulating spaceplanes	14
European Aviation Safety Agency	15
4 Liabilities, indemnities and insurance	19
Power to limit the requirement to indemnify Government	19
Third party liability and insurance	20
Ease of proving liability against licensees	21
Immunity from liability	22
5 Order-making power	24
Clause 14: Henry VIII power	24
Clauses 20, 21 and 51: security requirements, exceptions, and offences	25
Clause 29: Government-authorized action	26
Clause 63	28
Conclusions	29
Conclusions and recommendations	31
Formal Minutes	35
Witnesses	36
Published written evidence	37
List of Reports from the Committee during the current Parliament	38

Summary

We share the Government's determination to enable commercial spaceflight from the UK. As we stated in our 2016 report, *Satellites and Space*, the space sector has delivered important benefits to the UK economy, generating a turnover of £11.8 billion in 2012–13 and employing 35,000 people. Efforts by the Government to develop the UK market for space activities even further, and secure first mover advantage, are therefore very encouraging. The sector strongly welcomes the publication of the draft Bill, as we do, while the Government's ambitious timetable for UK launches will help to maintain momentum in an area that is vital for UK technology, science and business. We therefore support the thrust of the draft Bill, although we have identified areas which will need further attention if and when the next Government brings forward a spaceflight bill.

The lack of detail on the face of the Bill has made detailed scrutiny difficult at this stage. There are still many 'unknowns' where commercial spaceflight is concerned, and the Government's approach has been to issue a "skeletal bill" with powers placed in the hands of regulators, and the Secretary of State, to plot a course through the unknown. Consequently, the draft Bill contains a large number of delegated powers—103 provisions in a Bill with 67 clauses—to bring forward secondary legislation in the future, of which only six are afforded the 'affirmative resolution' procedure. Some of these, including clauses 29 and 63, are particularly wide-ranging, while others, such as clauses 21 and 51, are potentially inappropriate delegations of legislative power.

Like some of our witnesses, we appreciate that the regulatory structure needs to be flexible, though it should not exclude proper parliamentary engagement, debate and scrutiny. If a spaceflight bill is introduced by the next Government, we suggest it re-examine the necessity of such wide-ranging powers and look again at what we believe to be the inappropriate delegations of power we have identified. Illustrative draft regulations should also be made available when any future Bill is published to assist Parliament's scrutiny of its provisions.

The Bill's Impact Assessment—produced when 'spaceflight' was still part of the Modern Transport Bill—does not include quantified costs and benefits. Making these numbers available only at the secondary legislation stage would provide Parliament with insufficient opportunity to consider its the economic implications. A more detailed, monetised cost-benefit analysis should be produced alongside any future spaceflight bill.

Elsewhere, we have identified where modifications need to be made to clauses covering 'liabilities, indemnities and insurance'; an area where industry expressed concerns that the provisions (as they stand) could prove prohibitive for small satellites and low-mass spacecraft—two fields in which the UK is a recognised leader. We also have concerns about the lack of a formal, written agreement from the European Aviation Safety Agency (EASA)—the body responsible for the development of European aviation legislation—confirming that 'EASA licences' will not be needed for commercial spaceflight operations while UK remains a member of the EU. An oral agreement to this effect is insufficient. This must be addressed quickly, so that it does not inadvertently hold up the next Government's spaceflight plans.

1 Introduction

Background

1. In December 2015, the Government published its first ever National Space Policy. At its launch, the then Business Secretary remarked that, historically, the UK had not been a “major player in space programmes” but that the policy would help to change the *status quo*.¹ Efforts to enable commercial spaceflight from the UK, however, have been underway for a number of years, though progress has not always been smooth. The Government articulated its initial ambition to “become the European centre for space tourism” and “hybrid’ space planes” in March 2011 in its *Plan for Growth*.² Eighteen months later, it asked the Civil Aviation Authority (CAA) to review what was required, “from an operational and regulatory perspective, to enable spaceplanes to operate from the UK by 2018”.³

2. The CAA’s subsequent *Review of commercial spaceplane certification and operations*, in July 2014, was timed to coincide with the identification of eight sites as potential locations for the UK’s first ‘spaceport’—a site for launching and potentially receiving spacecraft. The number of sites was subsequently reduced to five in March 2015 following a public consultation.⁴ Just over twelve months later, the competition to become the UK’s first spaceport ended when the Government opted for a licensing model to “create the regulatory conditions to enable any suitable location that can meet those conditions [...] to become a spaceport”.⁵ The *Modern Transport Bill*, announced in the 2016 Queen’s Speech, was intended to bring forward legislation to “allow for the construction of the first commercial spaceport” as well as other new forms of transport, including autonomous vehicles.⁶

3. Instead, almost six years after the Government raised the idea of the UK having its own launch capacity, the Transport Secretary announced on 9 February 2017 that the Government intended to publish a ‘stand-alone’ draft Spaceflight Bill later that month, dedicated to commercial spaceflight in the UK. The legislation was described by the Transport Secretary as:

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.⁷

The draft Spaceflight Bill was published on 21 February 2017.

1 [“National Space Policy: science fiction into science fact”](#) UK Space Agency News Story, 13 December 2015

2 HM Government, [The Plan for Growth](#), March 2011, para 2.306

3 [“Commercial spaceplane certification and operations: UK government review”](#), 15 July 2014

4 [“Industry backs government’s spaceport plans”](#), Department for Business, Innovation & Skills news story, 3 March 2015.

5 [“UK spaceport competition axed in favour of licensing model”](#), The Herald, 20 May 2016; [“Government moves the goalposts in Newquay spaceport bid”](#), Plymouth Herald, 23 May 2016; Department for Transport ([SFB0007](#)) p12

6 HC Deb, 19 May 2016, column 170 [Commons Chamber]

7 Commercial Spaceflight: Written statement - [HCWS471](#), 9 February 2017

Purpose of the Spaceflight Bill

4. The Outer Space Act 1986 currently provides the legal framework for the UK to fulfil its obligations under the United Nations space treaties (see Chapter 3). The Act requires any UK organisation or individual launching, procuring a launch and/or operating space objects, to be licensed. Licensing powers are conferred on the Secretary of State and administered by the UK Space Agency. To date, launches licensed by the UK Space Agency have taken place overseas. The draft Spaceflight Bill, in contrast, aims to enable “commercial spaceflight activities [...] to be carried out from spaceports in the United Kingdom” by providing for “the creation of a regulatory framework” and the licensing of “spaceflight activities”.⁸ The proposed framework covers both “launch to orbit and sub-orbital spaceflight” (potentially in ‘spaceplanes’), with clauses making provision for the grant of licences, the establishment of ranges (volumes of restricted airspace), safety and security, as well as liabilities, indemnities and insurance.

Our inquiry

5. On 27 February 2017, Ministers from the Department for Transport and Department for Business, Energy and Industrial Strategy (BEIS) wrote to us, along with three other select committees, inviting us “to consider the measures proposed” in the draft Spaceflight Bill.⁹ While no deadline for reporting was given, the Government told us that it was “committed to introducing [the] legislation in the House early in the 3rd session”.¹⁰ Since we had examined *Satellites and Space* in our 2016 report, we decided to take up the Government’s request. On 2 March we launched an inquiry to examine the draft Bill. We aimed to report before the end of the current Session so as to inform debate about, and suggest improvements to, the Bill before it was formally introduced.

6. We received 12 written submissions and held two of three planned oral evidence sessions, taking evidence from 12 witnesses. Due to a General Election being called, our third evidence session, scheduled with the Minister, was unfortunately unable to take place. We also obtained from the Government a draft of the delegated powers memorandum on 11 April 2017 and wrote to the House of Lords Select Committee on Delegated Powers and Regulatory Reform (DPRR Committee), inviting them to consider whether the delegated powers in the Bill offered sufficient opportunity for parliamentary scrutiny.¹¹ We are grateful to the DPRR Committee for agreeing to examine the draft delegated powers memorandum accompanying the Bill and for responding so promptly.¹² We would also like to thank everyone who contributed to the inquiry and for doing so on short notice.

7. Cabinet Office guidance recommends giving committees “at least three to four months (excluding parliamentary recess)” to scrutinise draft Bills.¹³ We have had just over five sitting weeks. Due to the compressed nature of our inquiry, we have focused our

8 Department for Transport, *Draft Spaceflight Bill*, Cm 9421, February 2017, p4 (Explanatory Notes)

9 Department for Business, Energy and Industrial Strategy (SFB0001)

10 *ibid*

11 Department for Transport (Delegated Powers Memorandum) (SFB0014). Delegated powers enable the Government to make changes to the law without needing to introduce a completely new Act of Parliament. A delegated powers memorandum lists the delegated powers contained in a bill and whether the ‘positive’ or ‘negative’ resolution procedure will apply, alongside a justification for the procedure proposed.

12 See House of Lords Select Committee on Delegated Powers and Regulatory Reform (SFB0012)

13 Cabinet Office, *Guide to Making Legislation*, July 2015, p 143

scrutiny on those areas in the draft Bill that we had previously examined in our *Satellites and Space* inquiry last year; spaceports (Chapter 2), licensing (Chapter 3), and liability (Chapter 4). In Chapter 5, we consider the order-making powers in the draft Bill. We regret that drafts of the regulations to be included in secondary legislation were not available, leaving us unable to review the substance of the majority of the changes proposed.

8. We also identified specific clauses in the draft Bill where we felt further clarification and comment from the Government would be helpful. Most of these clauses were on matters unrelated to our previous *Satellites and Space* work. We therefore wrote to the Department for Transport with 35 questions and requested the publication of the Bill's 'Impact Assessment', a document that identifies the objectives, and reviews the likely costs, benefits and uncertainties of the policy changes envisaged by a bill. The relative costs and benefits of alternative approaches to achieving the Bill's purposes, and the costs of leaving legislation unmade, are also usually set out in an Impact Assessment. We are grateful for the Department's swift response to our requests, though note that the Impact Assessment provided to us is titled *Modern Transport Bill - Spaceflight* and dated 30 September 2016, suggesting that it had yet to be updated when the Modern Transport Bill was split into the *Vehicle Technology and Aviation Bill* and the draft Spaceflight Bill.¹⁴

A note on terminology

9. We have tried, wherever possible, to use the 'space' terminology set out in clause 1 of the draft Bill. We did, however, receive a number of written submissions questioning its consistency and accuracy. UKspace (the trade association for the space industry) told us that it was "unfortunate that the majority of the terminology used" in the Bill was "not consistent with that used in and by the space industry".¹⁵ Similarly, the British Interplanetary Society reported that "many of the key terms used in the Bill" were either "poorly defined, or have definitions that clash with established international industry definitions". It added that there did "not appear to be a clear reason why the terminology [differed]" and thought that it seemed "primed to cause significant confusion as a result".¹⁶

10. One example, highlighted by UKspace, was that the Bill "uses the term 'spacecraft' to refer to what the industry would refer to as a 'launch vehicle' or 'launch system'".¹⁷ The draft Bill also separately defines "space activity" and "sub-orbital activity" in clause 1(2), only to merge them as "spaceflight activities" for the remainder of the Bill. The Government explained that this was because they "will be regulated separately" but that the over-arching term 'spaceflight activities' was used to cover sub-orbital and space activities because "this is a convenient way of referring to both".¹⁸ Rebecca Evernden from the UK Space Agency added that the Government had:

tried to strike a balance between making [definitions] broad enough to ensure that various activities, both now and in the future, can be captured, and making sure that we are as consistent as possible with the various

14 The questions and responses were published as written evidence to the inquiry, see Department for Transport ([SFB0013](#)); Department for Transport (Impact Assessment) ([SFB0007](#))

15 UKspace ([SFB0006](#))

16 British Interplanetary Society ([SFB0004](#)); see also Newton Launch Systems Ltd ([SFB0005](#))

17 UKspace ([SFB0006](#))

18 Department for Transport ([SFB0013](#))

international treaties in existence [...] In the guidance notes [accompanying the Bill] we will make sure that we provide a full explanation of what those terms mean.¹⁹

11. ***If the next Government brings forward a bill to enable spaceflight activities from the UK, we would encourage it, for the sake of clarity and consistency, to work with industry to ensure that the terminology used reflects international norms as far as possible.***

2 Establishing a UK launch capacity

Establishing a UK launch capacity: the current challenges

12. The Government has set itself a tight timetable to enable commercial spaceflight to take place from the UK. The draft Spaceflight Bill aims “to stimulate the market for space activities [...] and sub-orbital spaceflight activities in the United Kingdom from 2020”,²⁰ while the accompanying Impact Assessment—prepared when ‘spaceflight’ was still part of the Modern Transport Bill—anticipated that the first sub-orbital flight from the UK would take place in 2021.²¹ According to the Government, this timetable aimed to capitalise on the UK’s “opportunity to secure first mover advantage over potential European competitors” while also increasing the UK’s share of the global space market.²² The Science Minister, Jo Johnson MP, explained in February 2017 that the Government was “laying the groundwork needed for business to be able to access this lucrative global market worth an estimated £25 billion over the next 20 years”.²³

13. Richard Peckham from Airbus noted that there “had not previously been the demand” for the UK to have its own launch capacity because “there were enough launchers in the market” but suggested that the situation had now changed.²⁴ Mark Thomas from Reaction Engines similarly told us that:

The technology changes around satellites and the development of smaller satellites [have created] a greater demand for availability of launches that cannot be satisfied by the current launch solutions. I think we have seen an evolution in the industry and we are stepping into a new paradigm [...] This is the ideal opportunity for the UK to take its place and its lead in that new market.²⁵

14. Some witnesses were less than optimistic, however, about achieving the 2020 target. Sir Martin Sweeting from Surrey Satellite Technology Ltd described the target as “ambitious—very ambitious”²⁶ while Richard Peckham thought that it was “close to impossible”.²⁷ Mark Thomas explained that while he was not in the “pretty impossible camp” it was a “very challenging”²⁸ target:

From our perspective [...] we hope we are on an engine-development journey—technology and engine development—that will not mature for another five years or so but that will support the next-next generation of launchers, perhaps, from the mid-2020s onwards.²⁹

20 Department for Transport, *Draft Spaceflight Bill*, [Cm 9421](#), February 2017, p4 (Explanatory Notes)

21 Department for Transport ([SFB0007](#)) p38

22 Letter from the Department for Transport and the Department for Business, Energy and Industrial Strategy ([SFB0001](#))

23 “[Government announces boost for UK commercial space sector](#)”, Department for Business, Energy and Industrial Strategy et al, press release, 9 February 2017

24 Q3

25 Q27 [Mark Thomas]

26 Q71 [Sir Martin Sweeting]

27 Q12 [Richard Peckham]

28 Q33 [Mark Thomas]

29 Q29

15. Along with the space and satellites sector, we welcome the Government’s publication of the draft Spaceflight Bill to pave the way for commercial spaceflight activities to be carried out from the UK. While the Government has set an ambitious timetable for UK launches, which may not be met in practice, the targets are useful in helping to maintain momentum in an area that is vital for UK technology, science and business.

Securing an operator

16. As well as introducing legislation to enable spaceflight operations from the UK, the Government has created a £10 million fund to “incentivise the commercial spaceflight market”.³⁰ Grants are to be made available to organisations developing spaceflight capabilities, “such as building spaceport infrastructure or adapting launch vehicle technology for use in the UK”.³¹ Virgin Galactic, a US ‘spaceflight services provider’, welcomed the funding, describing it as “vital to establishing spaceflight capability”.³² The Royal Aeronautical Society’s *Aerospace* magazine questioned whether such a stimulus was sufficient, however, stating that £10 million was “a drop in the ocean for developing a new airliner—let alone a space launch system or even a spaceport”.³³

17. The Government has publicly stated that it does not intend to fund the establishment of a UK spaceport or commercial spaceflight operations. The Science Minister told us in 2016 that the Government had “always made it clear that [spaceflight] is primarily a commercial enterprise. Government’s role is to make sure that there is an enabling regulatory environment and that we work through all the complex regulatory and technical issues that having a spaceflight capability involves”.³⁴

18. Without direct funding from the Government, success will be contingent upon the commercial development of a UK spaceport going hand-in-hand with spaceflight operators wanting to establish launches from the UK. The Impact Assessment, for example, stated that the Government “would expect any potential spaceport to have a launch operator in hand before carrying out the process of spaceport licensing”, adding that it did not “foresee a ‘build it and they will come’ approach to be viable”.³⁵

19. We were unable to establish, however, exactly how many operators are seriously looking to establish a launch capacity in the UK. The costs and benefits of the Bill were deemed ‘non-quantifiable’ in the September 2016 Impact Assessment until information on a number of factors becomes available, including “clarity regarding potential launch operators”.³⁶ This is expected, according to the Impact Assessment, at the secondary legislation stage:

30 [“Government announces boost for UK commercial space sector”](#), Department for Business, Energy and Industrial Strategy et al, press release, 9 February 2017

31 *ibid*

32 Virgin Galactic ([SFB0011](#))

33 Tim Robinson, [“Blast off from Britain”](#), *Aerospace Insight (Industry News)*, 17 February 2017. By way of comparison, Spaceport America—the world’s first purpose-built commercial spaceport—was funded predominately by the US state of New Mexico which provided two-thirds of the 200 million plus dollars required to build the facility.

34 Oral evidence taken on 15 March 2016, HC (2015–16) [804](#),Q181 [Minister]

35 Department for Transport ([SFB0007](#)) p21

36 *ibid* p3

The detailed design of [the] framework is at pre-consultation stage so robust estimation of costs such as compliance, engagement and familiarisation cannot be made. That analysis will be carried out in the [Impact Assessments] that will be done at consultation and implementation stage for the secondary regulation and licensing requirements.³⁷

The Royal Aeronautical Society identified the apparent absence of prospective operators as a gap in the draft Bill. It noted that while the Bill addressed “the legislation necessary to regulate the establishment and operation of [UK] spaceports”, it appeared “not to address how to attract entrepreneurial launch operators”.³⁸ Rebecca Evernden from the UK Space Agency told us in April 2017 that while she could not “say exactly which operators are interested” the Government was “running a process [. . .] at the moment where spaceports and operators have been asked to form partnerships”, adding that there was “a large number of spaceports and operators still in the running”.³⁹

20. Legislating for novel technologies is always challenging. The Government is right to avoid a ‘build it and they will come’ approach to establishing spaceports. Nevertheless, the current lack of clarity regarding potential launch operators raises questions as to whether the apparent ‘legislate and they will come’ approach underpinning the draft Bill will prove successful. The absence of quantified costs and benefits in the Impact Assessment makes it impossible to judge how thoroughly the Government has tested the appropriate extent of the financial support it should provide. Making these numbers available only at the secondary legislation stage gives Parliament little opportunity to scrutinise the economic implications of the Bill.

21. *We recommend that, if the next Government introduces a spaceflight-enabling bill, it also publishes a revised Impact Assessment which:*

- a) *includes a more detailed, monetised cost-benefit analysis; and*
- b) *provides clear evidence that there are launch operators who are serious about locating in the UK and that legislative change—rather than funding—is what is required to enable them to do so.*

Export controls

22. Spaceport and spacecraft operators may come from outside of the UK. In its 2014 *Review of commercial spaceplane certification and operations*, the Civil Aviation Authority (CAA) noted that the organisations “expected to commence commercial spaceplane operations first—Virgin Galactic and XCOR Aerospace” were based in the United States.⁴⁰ Virgin Galactic, for example, is “currently carrying out flight testing in Mojave California, ahead of starting commercial suborbital operations from New Mexico’s Spaceport America”.⁴¹ Mark Thomas from Reaction Engines highlighted that one way of meeting the Government’s 2020 target (paragraph 12) would be to enable US-based companies to operate from the UK. “Various proposals”, he told us, had been raised, “including

37 *ibid* p2

38 Royal Aeronautical Society ([SFB0010](#))

39 Q101 [Rebecca Evernden]

40 Civil Aviation Authority, [UK Government Review of commercial spaceplane certification and operations](#). Technical report, July 2014, para 4.1

41 Virgin Galactic ([SFB0011](#))

wet leasing a US system, where the full operation is a US system, US manned and US operated”.⁴² Glasgow Prestwick Airport suggested that clause 7(3) of the draft Bill—which states that the regulator may only grant a licence under the Act if it is satisfied that (amongst other things) it is “consistent with the international obligations of the United Kingdom”—seemed designed to facilitate so-called ‘wet licence’ operations. According to Glasgow Prestwick Airport, the clause would mean that “US based companies that fall [within] the terms of the US Munitions List and the International Traffic in Arms Regulations (ITAR) [would] not be compromised if they launch from a UK site”.⁴³

23. Such an arrangement, however, may not be straightforward. As the CAA explained in 2014, the “US export control regime limits such operations outside the US”: under ITAR, “US spaceplane manufacturers would not be allowed to export their goods to the UK”.⁴⁴ The CAA stressed that if this matter were left unaddressed it would “certainly delay development” in the UK:

Without US spaceplane operators, it is extremely unlikely that there would be any operations from the UK by 2018—and will potentially diminish the commercial opportunities and economic benefits sought from the sector, including the development of a UK spaceport.⁴⁵

To deploy spaceflight systems originating in the US, Virgin Galactic also suggested that a “Technology Safeguards Agreement, or similar” was needed to “facilitate the export of relevant technology and, potentially, setting up related infrastructure”.⁴⁶

24. Despite the CAA identifying ITAR in 2014 as a potential barrier to the growth of UK launches, progress in addressing the matter appears limited. Rebecca Evernden from the UK Space Agency described the ITAR “restrictions” as “something we have to tackle with the US”.⁴⁷ She noted that while discussions were “ongoing at the moment” there had been “no substantial change in the US Administration’s position [...] The policy of the US is not to encourage widespread use of this technology, and they are quite careful about where agreements are made”.⁴⁸

25. There is a risk that the United States’ International Traffic in Arms Regulations (ITAR) may inhibit the full development of the UK’s commercial spaceflight ambitions and curtail some of its economic benefits. *In its response to this report, we ask the next Government to set out how it will address any barriers presented by ITAR, when it expects the matter to be resolved, and what contingency plans it will put in place if an agreement cannot be reached.*

42 Q33 [Mark Thomas]. The CAA describes a ‘wet lease’ type agreement, in this context, as one where a “US operator is wholly responsible for the entire operation, which would be conducted under licence from the FAA AST [US Federal Aviation Administration Office of Commercial Space Transportation]. In such circumstances, it is expected that the FAA AST would require operators to meet certain safety criteria, and in particular to carry out an expected casualty analysis”.

43 Glasgow Prestwick Airport (SFB0003)

44 Civil Aviation Authority, [UK Government Review of commercial spaceplane certification and operations](#). Technical report, July 2014, paras 4.4 and 4.37.

45 *ibid* para 4.49

46 Virgin Galactic (SFB0011). See, for example, [Agreement between the Government of New Zealand and the Government of the United States of America on Technology Safeguards Associated with United States Participation in Space Launches from New Zealand](#), June 2016

47 Q103

48 Q103–105

3 Licensing

26. The 1967 United Nations Outer Space Treaty,⁴⁹ together with the 1972 Liability Convention⁵⁰ and 1976 Registration Convention⁵¹ place obligations on states to:

- (1) ensure the safety of operations for space activities;
- (2) bear ultimate liability for costs arising from accidental damage to third parties from national space activities; and
- (3) maintain a register of objects sent into space .

The *Outer Space Act* 1986 provides the legal framework for the UK to fulfil its obligations under the UN space treaties. It requires any UK organisation or individual launching, procuring a launch and/or operating space objects, to be licensed. Licensing powers are conferred on the Secretary of State and administered by the UK Space Agency.⁵²

27. During our *Satellites and Space* inquiry in 2016, some witnesses told us that spaceflight licensing had failed to keep pace with new trends in the sector, especially the growth of small satellites and satellite constellations.⁵³ Similar points were raised in our current inquiry. Joanne Wheeler, a partner at Bird & Bird, explained that the “Act in 1986 was drafted in a world where very large satellites were going into geostationary orbit”.⁵⁴ Richard Peckham from Airbus noted that there were now “a lot of small constellations of satellites [...] tens, even hundreds, of smaller satellites that fulfil a similar function but are different or complementary”.⁵⁵ The draft Bill introduces a new licensing regime for UK launches consisting of the following:

- (1) an operator licence, to conduct spaceflight activities;
- (2) a spaceport licence, to operate a spaceport; and
- (3) a range control licence, to administer a volume of airspace.⁵⁶

28. We received mixed evidence about the licensing provisions in the draft Bill and whether they represent an improvement on the *status quo*. Joanne Wheeler was positive that the draft Bill was more able to cater for current satellite technologies:

Section 7(5) is flexible enough to deal with CubeSats and what is called a ‘traffic light’ approach. I also think it deals with mega constellations and in-

49 [Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies](#) (General Assembly resolution 2222 (XXI), annex)—adopted on 19 December 1966, opened for signature on 27 January 1967, entered into force on 10 October 1967

50 [Convention on International Liability for Damage Caused by Space Objects](#) (resolution 2777 (XXVI), annex)—adopted on 29 November 1971, opened for signature on 29 March 1972, entered into force on 1 September 1972

51 [Convention on Registration of Objects Launched into Outer Space](#) (resolution 3235 (XXIX), annex)—adopted on 12 November 1974, opened for signature on 14 January 1975, entered into force on 15 September 1976

52 [Guidance: Licence to operate a space object: how to apply](#), UK Space Agency, last updated 29 November 2016.

53 Science and Technology Committee, Third Report of Session 2016–17, [Satellites and Space](#), HC 160, p25

54 Q8

55 Q2 [Richard Peckham]

56 The Outer Space Act 1986 will continue to apply to launches taking place outside the UK involving UK nationals and companies.

orbit servicing missions with a technical assessment liability [...] Section 10(1)(c) allows an operator licence to be granted for one or more particular spaceflight activities, so families of satellites can be licensed together.⁵⁷

Witnesses were less convinced, however, about the terms of the new licences relating to liabilities, indemnities and insurance. We examine these in detail in Chapter 4.

29. There appears to be a degree of confusion regarding who needs an operator licence. UKspace, the trade association for the space industry, stated that:

It is not clear from the bill, [in] its current form, which parties require to be licensed and in what manner. The vague definition of the term ‘operator’ in the bill and its lack [of] consistency with space industry terminology could result in confusion moving forwards.⁵⁸

When we asked the UK Space Agency who would need an operator licence, Rebecca Evernden replied that an “operator licence would be required by anyone carrying out a spaceflight activity”, which would include “both the orbital activity and the sub-orbital activity”. This does little to clarify the situation, however, as it is almost identical to the definition in clause 3(2) of the draft Bill.⁵⁹

30. There also appears to be confusion regarding the issuing of licences and, more specifically, if a licence would be required for each mission, or whether a ‘blanket’ licence could be issued to an operator to conduct a particular space activity repeatedly, such as sub-orbital flights. Stuart McIntyre from Orbital Access thought that there might “be some types of mission for which some sort of blanket permission can be granted” as well as others “that absolutely require individual licensing because of their particular unique nature”, adding that the “Bill clearly creates the framework for all those types of approaches to be developed as appropriate”.⁶⁰ Dr Crowther from the UK Space Agency, in contrast, explained that the regulator:

would always expect to issue a licence for every object launched, simply because when you have, say, 200 satellites, and one fails and is withdrawn from the constellation, you need a way of managing the licensing issues around it.⁶¹

31. We recommend that any future spaceflight bill fully clarifies who would need an operator licence and whether licences will be issued on a mission by mission basis. Additional information should also be included in the Explanatory Notes accompanying the bill.

57 Q8. Rebecca Evernden from the UK Space Agency later clarified, however, that while the traffic light system had “been trialled in relation to procuring an overseas launch for operating space objects”, the Space Agency did not currently “envisage applying it to launch in the UK” (see Q106).

58 UKspace (SFB0006)

59 Department for Transport, *Draft Spaceflight Bill*, Cm 9421, February 2017, clause 3(2). This states that an operator licence “means a licence [...] authorising a person to carry out spaceflight activities”.

60 Q80 [Stuart McIntyre]

61 Q107 [Dr Crowther]

Setting licence conditions

32. Provision is made to set conditions attached to licences in clause 11 of the draft Bill, with an illustrative list of 38 possible conditions provided in Schedule 1. The House of Lords Select Committee on Delegated Powers and Regulatory Reform raised concerns with us about the delegated powers related to licensing. They highlighted clause 11(6) which states that “regulations may prescribe what the holder of a licence under this Act may or must do in order to comply with prescribed kinds of licence conditions”.⁶² The Committee did not think, however, that the existence of Schedule 1 justified the negative procedure, instead concluding that:

Given the centrality of licences to the Draft Bill, and given the open-endedness of the regulation-making powers in clause 11(4) and (6) [...] these regulations should be subject to the affirmative procedure.⁶³

The Committee similarly identified clause 3, on prohibition of unlicensed spaceflight, as being of “central importance [...] to the draft Bill” and a “good example [of] where illustrative regulations would have assisted” its deliberations.⁶⁴ It noted that clause 3(6) “allows negative regulations to make ‘further provision for the purposes of this section’ including providing eligibility criteria for a licensee” and concluded that regulations made under “clause 3(4) and (6) should attract the affirmative procedure”.⁶⁵

33. **We agree with the House of Lords Select Committee on Delegated Powers and Regulatory Reform that the clauses relating to licensing are of central importance to the draft Bill and that making illustrative regulations available would have assisted our scrutiny.** We examine this broader point, and the order-making powers in the Bill, in detail in Chapter 5.

Regulating spaceplanes

34. Licensing ‘spacecraft’, and specifically spaceplanes, raises additional challenges compared to small satellites and other ‘space objects’. The Civil Aviation Authority (CAA) defines a spaceplane as a “winged vehicle that acts as an aircraft while in the atmosphere and as a spacecraft while in space”.⁶⁶ Though there are a variety of spaceplane designs, they are all generally intended to be reusable, “to operate at either a sub-orbital or an orbital level” and to take off horizontally.⁶⁷ CAA and Department for Transport lawyers have stated that “spaceplanes meet the internationally accepted definition of an aircraft” and that future legislation was therefore “likely to be based on aviation principles”.⁶⁸ Our witnesses from Reaction Engines and Bristol Spaceplanes believed that this approach had been transposed into the draft Bill.⁶⁹

62 Department for Transport, *Draft Spaceflight Bill*, Cm 9421, February 2017

63 House of Lords Select Committee on Delegated Powers and Regulatory Reform ([SFB0012](#))

64 *ibid*

65 *ibid*

66 Civil Aviation Authority, [UK Government Review of commercial spaceplane certification and operations](#). Technical report, July 2014, para 2.1

67 *ibid*

68 Civil Aviation Authority, [UK Government Review of commercial spaceplane certification and operations](#). Technical report, July 2014, para 6.145

69 Q36

35. In civil aviation, however, the ‘airworthiness’ of an aircraft must be ensured and certified. This is achieved in a number of ways, including approving the organisations that work on the aircraft through the licensing of their personnel, as well as the approval of their design and production processes. Regulations have been developed over the last 100 or so years,⁷⁰ with formal international harmonisation of aviation law beginning with the ratification of the *Convention on International Civil Aviation* (the ‘Chicago Convention’) in 1947.

36. The commercial spaceplane industry, in contrast, is in its infancy and an equivalent international regulatory regime does not exist. Witnesses advised against simply applying civil aviation standards to spaceplanes. Mark Thomas from Reaction Engines told us that “if you throw the entire [civil aviation] rulebook at [spaceplanes], then it is going to be a very difficult exercise”.⁷¹ Virgin Galactic instead recommended that UK legislation focus “on overall system safety as an overarching approach, with vehicle licensing rather than type certification”.⁷² The CAA concluded in 2014 that adherence to civil aviation standards “at this stage [...] cannot be expected” because:

the safety performance of spaceplanes is largely unknown; and there are no international certification standards available for spaceplanes. Furthermore, with the very diverse nature of spaceplane designs, there has been little opportunity to develop standardised operating procedures.⁷³

The CAA therefore recommended that:

ultimately, a comprehensive international legal and regulatory framework will be needed to oversee spaceplane operations and to help deliver an acceptable level of safety, not only for spaceflight participants, but also for other airspace users and the uninvolved general public.⁷⁴

European Aviation Safety Agency

37. Responsibility for developing “a comprehensive international legal and regulatory framework” for spaceplanes was initially identified by the Government as resting with the European Aviation Safety Agency (EASA). Under the terms of EU Regulation 216/2008—known as the EASA Basic Regulation—EASA is responsible for the development of European aviation legislation.⁷⁵ The CAA reported in 2014 that the “strict application of the legal view that spaceplanes are aircraft would suggest that the full weight of EU aviation legislation would apply to all UK spaceplane operations”. It concluded that:

70 In 1920, for example, the UK passed the *Air Navigation and Transport Act* which gave the British Empire the authority to control air navigation in the Commonwealth countries and territories.

71 Q38 [Mark Thomas]

72 Virgin Galactic ([SFB0011](#)). In civil aviation, type certification involves showing that an aircraft complies with airworthiness standards and is designed and manufactured in accordance with those standards.

73 Civil Aviation Authority, [UK Government Review of commercial spaceplane certification and operations](#). Technical report, July 2014, para 6.2

74 Civil Aviation Authority, [UK Government Review of commercial spaceplane certification and operations](#). Technical report, July 2014, para 5.2

75 [Regulation \(EC\) No 216/2008 of the European Parliament and of the Council](#) of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency

To operate within the EU, spaceplanes would therefore be required to meet regulations set by the European Aviation Safety Agency (EASA) which cover certification, continuing airworthiness and operations—unless the law is changed or an exemption granted.⁷⁶

38. Three years earlier, in its *Plan for Growth*, the Government had stated that it would “work with the European Aviation Safety Agency to ensure that there [was] an operating and certification environment defined so that [spaceplanes] can operate out of the UK”.⁷⁷ The CAA reported in 2014, however, that while EASA had “engaged with the EU to seek permission to commence the development of regulations for sub-orbital spaceplanes” it thought it was “unlikely that the EU will agree on a way forward until at least 2016”.⁷⁸

39. Since EASA regulations for spaceplanes have not been forthcoming, and given that spaceplanes cannot comply with the requirements of current EU aviation legislation, the CAA recommended that suborbital spaceplanes be classified as:

‘experimental aircraft’ and treated as Annex II aircraft under the EASA Basic Regulation—thus enabling regulation to be managed at a national [UK] level, through exemptions and special conditions to the Air Navigation Order (ANO).⁷⁹

“Experimental aircraft” are defined in the EASA regulations as those aircraft that are specifically designed for “research, experimental or scientific purposes, and likely to be produced in very limited numbers”.⁸⁰ Such aircraft and their airworthiness, their flight crew and their operations are not subject to EU regulation.

40. Detailed safety standards and conditions for spacecraft are not included in the draft Bill, but will be prescribed in secondary legislation and specified in licences. As we noted above, clause 11 states that “a licence under this Act may be granted subject to “(a) any conditions of the kinds described in Schedule 1, or (b) any other conditions, that the regulator thinks appropriate”.⁸¹ Schedule 1 includes conditions such as “safety requirements regarding the design and operation of spacecraft, carrier aircraft and payloads” but does not provide any further detail.

41. According to the CAA in 2014, EASA had “indicated its broad support” for treating spaceplanes as experimental aircraft “as a short-term solution”.⁸² The Government also confirmed in our current inquiry that:

76 Civil Aviation Authority, [UK Government Review of commercial spaceplane certification and operations](#). Technical report, July 2014, para 5.19

77 HM Government, [The Plan for Growth](#), March 2011, para 2.306

78 Civil Aviation Authority, [UK Government Review of commercial spaceplane certification and operations](#). Technical report, July 2014, para 6.52

79 Civil Aviation Authority, [UK Government Review of commercial spaceplane certification and operations](#). Technical report, July 2014, para 6.149

80 [Regulation \(EC\) No 216/2008 of the European Parliament and of the Council](#) of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency (see Annex II)

81 Department for Transport, *Draft Spaceflight Bill*, [Cm 9421](#), February 2017

82 Civil Aviation Authority, [UK Government Review of commercial spaceplane certification and operations](#). Technical report, July 2014, para 5.38

In recent discussions about revising the text of this Regulation, the European Commission and EASA agreed that while spaceplanes are in the experimental/developmental stage, spaceplane operations would fall under this exemption.⁸³

David Ashford from Bristol Spaceplanes told us that his company had also “spoken informally to EASA” and that it was “agreed fairly early on in the consultation process [a precursor to the draft Bill], that it would be much better for the UK for the CAA to be responsible” for regulation.⁸⁴

42. There is no reference to EASA, however, in the draft Bill or in the Impact Assessment. Furthermore, the EASA communications referred to by the CAA in its 2014 review seem to envisage that “limited commercial operations” would need to take place under “Restricted Type Certificates” that are issued by EASA and “Restricted Certificates of Airworthiness (RCofA) delivered by the [Member States]”.⁸⁵ An EASA-type certificate, in other words, appears to be necessary for even limited commercial operations, at least as long as the UK remains a member of the EU. Exactly where the boundary between ‘experimental/developmental’ flights and ‘limited commercial operations’ lies is unclear. Jeremy Stubbs from the CAA stated that it “depends on what you class as commercial operations”:

If you are talking about carrying passengers or cargo from one place to another—the traditional form of public transport—a much more rigorous type of certificate or examination of the vehicles used will be required. I believe it is EASA’s and probably our intention that we look to the future [...] to have some form of certificate issued.⁸⁶

43. We asked the UK Space Agency and the CAA whether they had anything in writing confirming that EASA accepted the UK’s approach to regulating spaceplanes nationally by classifying them as ‘experimental’. Jeremy Stubbs replied “no” and that:

In discussions with [Directorate-General for Mobility and Transport] at the EU and with EASA, we came to a verbal agreement that, as Europe was not currently in a position to regulate this very new industry, using Annex II to the Basic Regulation method of allowing national authorities to regulate would be the best way while this is a new and emerging industry.⁸⁷

Mr Stubbs added that he thought “the verbal agreement [with EASA had] worked” but that he noted our “comment and the question”.⁸⁸

44. There remains a risk that commercial spaceflight operations using horizontally-launched spaceplanes might not be exempt from European Aviation Safety Agency (EASA) regulations, even with the “experimental” exception allowed for in Annex II of Regulation (EC) No 216/2008. The limited amount of published information from EASA on this matter makes it clear that “limited commercial operations” could require “Restricted Type Certificates [...] issued by EASA”. We are therefore concerned that

83 Department for Transport (Responses on the Draft Bill) ([SFB0013](#))

84 Q42 [David Ashford]

85 Civil Aviation Authority, [UK Government Review of commercial spaceplane certification and operations](#). Technical report, July 2014, footnote 74 c)

86 Q126

87 Q123

88 Q124

the Bill has been drafted on the basis that ‘EASA licences’ will not be needed under EU regulations, for so long as the UK remains a member, without any formal agreement with EASA. Further clarity is required to establish where the boundary between ‘experimental’ and ‘commercial’ spaceplane operations lies.

45. If, as we hope, the next Government introduces a spaceflight bill in the months ahead, we recommend that a memorandum of understanding between the European Aviation Safety Agency (EASA) and the Civil Aviation Authority is signed as soon as possible to cover the period while the UK is still a member of the European Union. This should confirm the conditions under which spaceflight would cease to be deemed ‘experimental’ by EASA and would start to be viewed as ‘commercial’.

4 Liabilities, indemnities and insurance

Power to limit the requirement to indemnify Government

46. The 1972 Liability Convention makes the UK absolutely liable to pay compensation for damage caused by its “space objects” on the surface of the Earth or to aircraft. To cover that exposure, the *Outer Space Act 1986* requires a party carrying out certain space activities to indemnify the Government. Until 2015, indemnity had to be provided on an unlimited liability basis. Section 12 of the Deregulation Act 2015 amended the Outer Space Act 1986 to limit a party’s liability to indemnify the Government to €60 million. The Government also waived Insurance Premium Tax on satellite launches. These changes were warmly welcomed by the industry. UKspace (the trade association of the space industry) described them to us in 2016 as having helped “to create a level playing field for UK companies”.⁸⁹

47. Whether the €60 million cap on a party’s possible liability to the Government will be subject to further change is not clear from the draft Bill. Clause 10(2) of the draft Bill states that “an operator licence may specify a limit on the amount of the licensee’s liability [to indemnify Government, etc] in respect of the activities authorised by the licence”.⁹⁰ This differs from section 5(3) of the Outer Space Act 1986 (as amended by the Deregulation Act 2015) which says such a limit *must* be specified.

48. When asked if clause 10(2) could give rise to operators having unlimited liability, Joanne Wheeler from Bird & Bird replied “yes, you are absolutely right [...] It is possible for an operator to be required to fully indemnify the Government [...] We had an unlimited system before 2015”.⁹¹ Mark Thomas from Reaction Engines noted that clause 10(2) “could be a significant issue, hurdle or barrier to entry” for smaller companies.⁹² Joanne Wheeler was hopeful, however, that the UK Space Agency could “come up with a model that is workable”, adding that “discretion as to unlimited liability is probably still worth the Government having, as long as they apply it correctly”.⁹³ Similarly, Stuart Martin from the Satellite Applications Catapult explained that while “no business likes the concept of unlimited liability”, there was “flexibility” in the draft Bill to vary liability, adding that it would come down to the “detail of the [...] regulations as to how that gets implemented”.⁹⁴

49. The Government told us that “further work” needed to be carried out “on whether it is appropriate to cap any operator liabilities to HMG”.⁹⁵ It stressed, however, that the discretionary power reflected its belief that, in the case of a UK launch:

The risk of claims against HMG from other states’ nationals may be seen to be lower and therefore an operator’s liability to indemnify HMG for claims arising from such launch is not capped under the Spaceflight Bill. In the

89 UKspace and techUK ([SAT0020](#)), though that evidence referred to “a recent change to the regulatory regime to cap the third-party liability for UK satellite operators”.

90 Department for Transport, *Draft Spaceflight Bill*, [Cm 9421](#), February 2017

91 Q21

92 Q49 [Mark Thomas]

93 Q15, Q21

94 Q86, Q82

95 Department for Transport ([SFB0013](#))

case of UK launch, claims are likely to be made against the operator in the first instance, because clause 30 provides for strict liability for surface damage in the UK.⁹⁶

Rebecca Evernden from the UK Space Agency later added that the reason the cap was “included as a possibility, rather than a decision that has been taken at this stage, is the need to understand how the market is going to work in the UK”.⁹⁷

50. Over the past five years, the Government has taken steps to revise the indemnity and liability regime for UK operators to make it more internationally competitive. The draft Spaceflight Bill, however, potentially leaves open the possibility of a return to unlimited indemnities against Government liability being required from UK operators.

51. We recommend that, in line with the 1986 Outer Space Act, licences issued under a future spaceflight bill must specify the maximum amount of the licensee’s liability to indemnify Government.

Third party liability and insurance

52. Under the Outer Space Act 1986, the Government may require a licensee to obtain insurance in respect of damage or loss suffered by third parties.⁹⁸ In practice, it seems, this is also set at €60 million for most missions.⁹⁹ The draft Bill similarly provides that a licence may include a minimum insurance condition.¹⁰⁰ Some witnesses told our *Satellites and Space* inquiry that the UK’s insurance requirements for space activities remained particularly onerous when compared to other countries.¹⁰¹ Similar points were raised again in our current inquiry. Joanne Wheeler explained that “a third-party liability regime per satellite at €60 million does not work for constellations”:¹⁰²

If you are trying to launch 30, if not more, satellites at once, or have a constellation of 700-plus satellites, you will not have a commercial business plan if you are taking out insurance at €60 million per satellite.¹⁰³

53. The draft Bill would also introduce an entirely new power to make regulations imposing a cap on the liability of an operator arising from spaceflight activities when sustained in prescribed circumstances or by prescribed classes of people (clause 30).¹⁰⁴ The draft Bill allows the Secretary of State (i) to indemnify operators in respect of liability exceeding any minimum insurance requirement in the licensee’s licence (so far as uninsured), and (ii) to compensate claimants in respect of the excess of a claim above any clause 30 cap. There is, however, no obligation on the Secretary of State to do so: clause 31(2) states that “the Secretary of State *may* indemnify the licensee in respect of the excess to the extent that it is uninsured” (emphasis added). Indeed, the ‘spaceflight’ Impact Assessment prepared

96 Department for Transport ([SFB0013](#))

97 Q112

98 Outer Space Act 1986, Section 5(2)(f).

99 UK Space Agency, [Advance notification: introduction of a liability cap for UK Outer Space Act 1986 licensees](#), not dated. Last accessed 20 April 2017.

100 Department for Transport, *Draft Spaceflight Bill*, [Cm 9421](#), February 2017, clause 11 and Schedule 1, para 34(a)

101 Science and Technology Committee, Third Report of Session 2016–17, [Satellites and Space](#), HC 160, p25

102 Q18

103 Q15

104 Clause 30(5)

for the Modern Transport Bill indicates that the Government is not intending to use these powers “to create a government liability at this stage”.¹⁰⁵ Taken as a whole, there appears to be the risk that Clause 31 in the draft Spaceflight Bill could potentially leave the uninvolved general public (‘third-parties’) without full compensation for an incident.

54. We heard that this also has ramifications for the UK space industry, and particularly for space SMEs. Paul Davey from Lockheed Martin explained that if the Government did not indemnify licensees’ uninsured liability, potential operators—particularly of small, low mass spacecraft—could “definitely” be put off:

At the lower end, if the costs are prohibitive because of insurance regulations [...] it will become very difficult for people to enter the market, and then it becomes the domain of people operating traditional spacecraft of hundreds of kilos, up to thousands of kilos.¹⁰⁶

55. Protecting the uninvolved general public from harm arising from commercial spaceflight must be paramount. When incidents do occur, however, it is vital that harmed third parties have recourse to full remedy. We are concerned that clauses 30(5) and 31, as currently drafted, could leave the uninvolved public without full compensation for an incident. *If the next Government introduces a spaceflight bill, it should indemnify claimants for losses exceeding any prescribed limits on operators’ liability, and for any uninsured loss above a licensee’s minimum required level of insurance.*

Ease of proving liability against licensees

56. Under the draft Bill, ease of establishing liability against an operator appears to depend on where the damage occurs. Clause 30(2) would impose on operators strict liability (where the claimant does not need to prove negligence, for example) for injury or damage caused “to a person or property on land or water” by things falling from space objects or spacecraft, or by the people in them. The clause does not apply, however, to damage caused to those in the air (eg damage to other aircraft, which could be carrying passengers).

57. Joanne Wheeler from Bird & Bird indicated that this was out of step with the 1972 UN Convention on International Liability for Damage Caused by Space Objects (the ‘Liability Convention’):

Section 30(2) [of the draft Bill] deals with injury or damage to persons or property on land and water caused by any craft or space object. It says that for any damage on land and water [...] you do not need to prove fault, but under the Liability Convention that also includes aircraft in flight. One of the gaps is: Why does that not include aircraft in flight? Then it would be a complete translation of [...] the Liability Convention.¹⁰⁷

105 Department for Transport ([SFB0007](#)) p6

106 Q24

107 Q22

More specifically, article 2 of the Liability Convention provides that a launching state shall be absolutely liable for damage caused by a space object “on the surface of the Earth or to aircraft in flight”.¹⁰⁸

58. When questioned on this point, the Government explained that clause 30(2) “copies the approach in [section] 76 of the Civil Aviation Act 1982” and gives “UK nationals a straightforward cause of action for surface damage in UK” on the grounds that it is “not covered by the Liability Convention”.¹⁰⁹ It added that “damage to aircraft in flight is likely to have been excluded on the basis that it would be a species of collision, and so more suitable for an ordinary claim in negligence, rather than a statutory imposition of liability”.¹¹⁰ Our concerns, however, were ‘noted’ and the Government proposed “to review this issue further”.¹¹¹

59. Tim Johnson from the CAA similarly promised to consider the matter further. He explained that the Civil Aviation Act 1982 gives “direct responsibility to the carrier to provide passengers on planes who suffer loss with compensation in line with international treaties”.¹¹² The CAA was therefore “satisfied that, should a third party be impacted, there is a route for dealing with them. It would then be for the airline operator, if it had cause, to pursue the spaceflight operator for damages in that particular circumstance”.¹¹³ When questioned on whether this approach was additionally onerous on the aviation industry, Mr Johnson replied that he was aware this “issue has been raised; so, as part of the process we will go away and reflect on that”.¹¹⁴

60. ***If a spaceflight bill is introduced by the next Government, we recommend that the current draft clause 30(2) be revised to ensure that it covers injury or damage caused to a person or to property that is airborne.***

Immunity from liability

61. Clause 33 grants a regulator immunity from liability in respect of spaceflight-related actions. When we asked why immunity was needed, the Government noted that, unlike civil aviation, there are no international or EU safety standards for spaceflight activities against which a regulator can make an assessment. It also pointed to the approach adopted in the United States, highlighting that:

US legislation gives special protection to the US Government (which regulates spaceflight in that jurisdiction), in the form of waivers. These provide that the Government has not certified the vehicles as safe and there is a waiver of claims against the Government and employees etc except in the case of wilful misconduct.¹¹⁵

108 [Convention on the international liability for damage caused by space objects](#), United Nations Treaty Series, 1975 Article II.

109 Department for Transport ([SFB0013](#)). The Convention covers damage caused by one ‘launching state’ to another ‘launching state’. It does not apply to damage ‘within’ a state, eg damage caused by a UK space object, launched from the UK, to people or property on UK land, water or air.

110 Department for Transport ([SFB0013](#))

111 Department for Transport ([SFB0013](#))

112 Q114

113 Q114

114 Q116

115 Department for Transport ([SFB0013](#))

62. The Government therefore felt that “the principle of regulator protection [was] warranted”.¹¹⁶ Tim Johnson from the CAA emphasised that immunity was provided for regulators because spaceflight is an:

inherently a new activity and there is not a track record in understanding how the industry performs and where the risks will be, which is very much in contrast to the experience we have in civil aviation. Recognising that, we think the provision is appropriate in these circumstances at this time. That may change as and when the industry becomes more mature and an integrated part of the UK transport and industrial landscape.¹¹⁷

Glasgow Prestwick Airport was not entirely convinced, stating that:

Given the central role of the Regulator in determining large aspects of how spaceflight should be conducted, we think that an additional ground for removing the Regulator’s protection should be that they acted in a grossly negligent way.¹¹⁸

63. The Government, understandably, is seeking to implement flexible framework legislation because future eventualities are unknown, but it is also planning to grant regulators an indeterminate immunity from claims even as the industry matures and the risks may become clearer. *We recommend that, if the next government brings forward a spaceflight bill, it considers granting a further exception to the currently-drafted clause 33 where it can be shown that a future regulator has acted with gross negligence. Provisions should also be included to regularly review the immunity provided under the legislation.*

116 Department for Transport ([SFB0013](#))

117 Q139

118 Glasgow Prestwick Airport ([SFB0003](#))

5 Order-making power

64. The draft Bill provides for the creation of a regulatory framework to enable commercial spaceflight from the UK. As such, much of the detail is not on the face of the Bill, but will be set out in secondary legislation. Several witnesses expressly welcomed the flexibility of this framework.¹¹⁹ Joanne Wheeler, from Bird & Bird, told us:

It sets out a very good, robust, high-level umbrella, a framework that is flexible enough to implement what the UK would look to do moving forward with different types of technology.¹²⁰

On the other hand, the House of Lords Select Committee on Delegated Powers and Regulatory Reform (DPRR Committee) cautioned that they:

had doubts whether such a skeletal Bill was entirely appropriate. The Government may on reflection wish to reconsider some of these delegated powers and deal with them on the face of the Bill instead.¹²¹

65. There are 103 provisions containing delegated powers in the 67 clauses of the draft Bill. Of the 103 delegated powers, six are afforded the affirmative procedure. In this chapter we consider some of those provisions which have the effect of reducing the opportunities for parliamentary scrutiny of commercial spaceflight or significantly increasing the power of the executive.

Clause 14: Henry VIII power

66. Clause 14 gives the Secretary of State power by regulations to appoint “the CAA or another person” to exercise any function of the regulator under the Act, and to modify the application of the Act when making regulations.¹²² It is not clear from the draft Bill, the Explanatory Notes or the delegated powers memorandum, for what purposes modifications to the Act may be made: clause 14(4) simply refers to “any modifications that the Secretary of State thinks necessary or appropriate”.¹²³ The DPRR Committee identified clause 14(4) as a Henry VIII clause, a provision in a bill that “enables primary legislation to be amended or repealed [after it has become an Act of Parliament] by subordinate legislation, with or without further Parliamentary scrutiny”.¹²⁴

67. The DPRR Committee stressed to us that the Government “does not appear to have offered any convincing reason for this Henry VIII power” and that the Committee therefore expected “regulations made under clause 14(4) to attract the affirmative procedure”.¹²⁵ The Government’s delegated powers memorandum, in contrast, does not acknowledge clause 14(4) as a Henry VIII power, instead concluding that:

119 Q8 [Joanne Wheeler], Q16, Q28 [David Ashford], Q28 [Mark Thomas]

120 Q4 [Joanne Wheeler]

121 House of Lords Select Committee on Delegated Powers and Regulatory Reform ([SFB0012](#))

122 House of Lords Select Committee on Delegated Powers and Regulatory Reform ([SFB0012](#))

123 Department for Transport, *Draft Spaceflight Bill*, Cm 9421, February 2017

124 House of Lords Select Committee on Delegated Powers and Regulatory Reform ([SFB0012](#)). See House of Lords Select Committee on the Scrutiny of Delegated Powers, Session 1992–93, HL 57, para 10. The clauses are named after Henry VIII because of the Statute of Proclamations 1539 which gave the King power to legislate by proclamation.

125 House of Lords Select Committee on Delegated Powers and Regulatory Reform ([SFB0012](#))

The Department [of Transport] considers the negative procedure is suitable for the power to make regulations as it will enable appropriate parliamentary scrutiny without expending valuable debating time.¹²⁶

68. *If the next Government introduces a spaceflight bill with provision similar to the currently-drafted clause 14(4), it should clarify why it is needed and give examples of the purposes for which the Act might be modified. Given the potentially wide ranging nature of such modifications, parliamentary scrutiny is essential and the affirmative resolution procedure should be adopted in any future bill.*

Clauses 20, 21 and 51: security requirements, exceptions, and offences

69. Clause 51 gives the Secretary of State the power to create offences by regulations and to specify the penalty for breach of the regulations made under the Bill. The clause is subject to the negative procedure; a move justified in the Government's delegated powers memorandum as providing:

the right level of parliamentary scrutiny needed in respect of the application of these provisions to spaceflight. It is envisaged that the offences will attach to the requirements provided for in secondary legislation to which the negative procedure applies.¹²⁷

70. The DPRR Committee stated that this was not a compelling justification “for a blanket power to criminalise any action required under any of the regulations” and which would give “Ministers carte blanche to criminalise anything they wish that is done in contravention of the regulations they make”.¹²⁸ The Committee therefore concluded that clause 51 represented “an inappropriately wide delegation of power”.¹²⁹ When asked why such a wide-ranging power was necessary, Rebecca Evernden from the UK Space Agency explained that, at present, she was unable to be more specific about some areas, such as offences and environmental requirements. She believed that flexibility was therefore needed in order to “to be able to see what we are presented with in terms of infrastructure on the ground”.¹³⁰

71. Similarly, clause 20(1) appears to give unlimited power to the Secretary of State to make regulations for ensuring security. This goes further than the power to give directions to specific persons in the Aviation Security Act 1982. The Government told us that the power in clause 20 was “more comparable to the broader aviation security framework powers in EC 300/2008, than the more limited direction giving powers in [sections] 12–14 Aviation Security Act 1982”.¹³¹

72. Examples of provisions that may be included in the security regulations are given in Schedule 4, though these do not limit the scope of the power (see clause 20(2)). The delegated powers memorandum noted that:

126 Department for Transport (Delegated Powers Memorandum) ([SFB0014](#)) p15

127 Department for Transport (Delegated Powers Memorandum) ([SFB0014](#)) p43

128 House of Lords Select Committee on Delegated Powers and Regulatory Reform ([SFB0012](#))

129 House of Lords Select Committee on Delegated Powers and Regulatory Reform ([SFB0012](#))

130 Q133

131 Department for Transport ([SFB0013](#))

at this early stage it is not clear exactly what level of provision is required and therefore it is appropriate that a power to make regulations is taken to provide for security arrangements.¹³²

Despite this uncertainty, the use of the negative resolution procedure is justified in the same memorandum on the basis that “Schedule 4 already provides a good level of transparency to Parliament” and that the clause reflects “existing provisions which are already in use to secure aviation security”.¹³³ The DPRR Committee, on the other hand, considered that the “regulations should be subject to the affirmative procedure”, given their “breadth and importance”.¹³⁴

73. The DPRR Committee was particularly concerned about clause 21. This would give the regulator power to grant exemption from security requirements in the prospective Spaceflight Act or “in any other piece of primary or secondary legislation relating to the security requirements in clause 20(1)”. The power is not subject parliamentary procedure and, as the DPRR Committee highlights:

There is no requirement to consult, to publish the content of the dispensation or do anything else save to obtain the consent of the Secretary of State, even though third parties might well be affected by the regulator’s decision.¹³⁵

The Committee deemed clause 21 to be “an inappropriate delegation of legislative power” adding that a regulator’s job was “to regulate compliance with the law, not to dispense people from it”.¹³⁶

74. *Before any spaceflight bill is introduced, the next Government must address the inappropriate delegations of legislative power contained in the current draft Bill at clauses 21 and 51.*

Clause 29: Government-authorised action

75. This clause is entitled “Power to authorise entry in emergencies”. It allows the Secretary of State to authorise the regulator to do “anything necessary” where someone involved in spaceflight activities does something which is a serious risk¹³⁷ to national security, to compliance with the UK’s international obligations, or to health and safety. The risk of contravening international obligations (which need not relate to spaceflight) must be serious, but it is not required that the feared contravention is a serious one. An authorisation *may* permit entry into premises, would be valid for a month and confers the power to use reasonable force. It would be an offence to obstruct someone exercising powers granted.

76. There will be no judicial involvement in authorising such actions. In contrast, under the Investigatory Powers Act 2016, warrants issued urgently by a Secretary of State

132 Department for Transport (Delegated Powers Memorandum) ([SFB0014](#)) p22

133 *ibid*

134 House of Lords Select Committee on Delegated Powers and Regulatory Reform ([SFB0012](#))

135 House of Lords Select Committee on Delegated Powers and Regulatory Reform ([SFB0012](#))

136 *ibid*

137 A warrant could be issued under clause 28 on wider grounds, in particular if the court were satisfied there were reasonable grounds for believing a licensee was refusing to comply with a direction issued by the Secretary of State because necessary or expedient in the interests of health or safety, national security, or relations with a country or territory outside the UK.

(without advance approval by a judicial commissioner) must be approved by a judicial commissioner within 3 working days of a warrant being issued.¹³⁸ The risk of contravening international obligations must be serious.

77. The Government's justification for the clause in the draft Spaceflight Bill is given in two lines in its delegated powers memorandum:¹³⁹

As this power is to be exercised in serious and urgent cases which cannot be specified with any particularity, these cannot be anticipated in primary legislation.

The Government also says that the power is intended to be used in very serious and urgent cases when there is no, or insufficient, time to apply for a warrant under clause 28. It pointed to the powers held by nuclear inspectors in the Energy Act 2013.¹⁴⁰ The UK Space Agency's evidence about this clause focussed on national security, not international obligations or health and safety. Rebecca Evernden from the UK Space Agency told us:

I think the primary reason is in cases of urgency where there may be a requirement to see what is happening. As we have referred to all along, clearly this is an inherently risky technology. There are potentially hazardous materials involved, and sensitive technologies; so we are building a framework to allow ourselves, in the interests of national security, if required, the ability to take the necessary action. I turn to my colleagues from the CAA, but I believe that we have tried to mirror what is required in aviation legislation to provide security around spaceports.¹⁴¹

78. It is likely, we understand, that the clause would be construed narrowly by the Courts because of the potential for its use in breach of the European Convention on Human Rights (ECHR).¹⁴² But any judicial scrutiny would only be possible after the Secretary of State has acted, and would not be automatic.

79. The powers in clause 29 are very wide, and not subject to any advance judicial scrutiny. The justification offered by the Government is insufficient. In particular, we are concerned about the following aspects of the clause:

- a) **the Courts are not involved either before or even, as a matter of course, after an authorisation and the power could be used—however inadvertently—incompatibly with fundamental rights. We have received no explanation why a magistrate could not be found within the month that an authorisation would last, nor even why a magistrate could not be contacted as urgently as the Secretary of State;**

138 Sections 24 (interception warrants), 109 (equipment interference warrants), 180 (bulk equipment interference warrants), 209 (specific bulk personal dataset warrants)

139 Department for Transport (Delegated Powers Memorandum) ([SFB0014](#))

140 Specifically, those in Sched 8, para 8; Department for Transport (Responses on the Draft Bill) ([SFB0013](#)).

141 Q135

142 See Human Rights Act 1998, section 3, and *R v Secretary of State for the Home Department, ex p Sims* [2000] 2 AC 115, 131 (HL). Article 5 of the ECHR, for example, guarantees a right to liberty except in accordance with law and for particular purposes (for example on reasonable suspicion of having committed an offence). An authorisation to detain someone would engage this article. Article 8 of the ECHR gives a right to respect for private life and home life and is likely to be engaged by any authorisation permitting entry into domestic property. The right to peaceful enjoyment of possessions (Article 1 of Protocol 1 to the ECHR) may also be engaged.

- b) **the Secretary of State will have power to act unilaterally in relation to potential breaches of treaties (whether or not ‘serious’); and**
- c) **in relation to national security, no explanation has been given for why existing powers available to law enforcement agencies would be inadequate.**

80. *We recommend that if the next Government introduces a spaceflight bill it either removes clause 29 or restricts it to matters of national security and health and safety. If it opts for the latter, we recommend that it provides in the legislation for judicial scrutiny at an early stage after the grant of an authorisation, circumscribes carefully the actions which could be taken and reduces to a minimum the period for which an authorisation would be valid.*

Clause 63

81. Clause 63 gives the Secretary of State a very general, wide-ranging power to make regulations “for carrying this Act into effect” in relation to space activities, sub-orbital activities and any “associated activities”. Examples of “associated activities” are highlighted in the Explanatory Notes as including (but not limited to) “spaceports, mission control centres, range control services and training”.¹⁴³ Joanne Wheeler was supportive of the clause, noting that “a degree of discretion needs to stay with the regulatory authority to make sure that there is an acceptable balance between risk and benefits”.¹⁴⁴

82. According to the Government, the purpose of the clause is to enable “full regulation of spaceflight activities” while at the same time providing sufficient flexibility and scope for regulations to be adapted as technology develops.¹⁴⁵ As the Government explained:

The sector is changing extremely quickly and new technologies continue to evolve. It is likely that these powers will continue to be required whilst Government builds its regulatory capability in this area.¹⁴⁶

Building on this point, Rebecca Evernden stressed that:

It is likely that we will have to amend regulations at various points in order to reflect [technological] changes; so we are trying to build in flexibility to be able to do that without too much delay [...] That is the primary reason for having the catch-all power in clause 63.¹⁴⁷

The Government also pointed to a similar power in the Civil Aviation Act 1982 to make provision “generally for regulating air navigation”.¹⁴⁸ Unlike the draft Bill, however, the power in the Civil Aviation Act 1982 does not refer to regulating undefined “associated activities”.

143 Department for Transport, *Draft Spaceflight Bill*, Cm 9421, February 2017, p8 (Explanatory Notes)

144 Q17

145 Department for Transport (Responses on the Draft Bill) (SFB0013)

146 *ibid.* See also Q132

147 Q132

148 *ibid.*

Conclusions

83. **It is clear that the Bill, with its focus on enabling commercial spaceflight from the UK, has been warmly welcomed by industry.** Stuart Martin from the Satellite Applications Catapult was one of a number of witnesses who highlighted that the UK, with its strong small satellite industry, “would be a great place to establish [a] new industry” that fills the current “gap in [small satellite] launcher capability worldwide”.¹⁴⁹ **We agree that the draft Bill represents an important step towards the UK taking a leading position in the development of commercial spaceflight, especially where small satellites are concerned.**

84. **The focus now will be on how a future bill will be implemented, and it is here that we have some concerns. A lack of detail on the face of the draft Bill, together with the large number of delegated and wide-ranging powers, reflects the uncertainty about how important aspects of commercial spaceflight from the UK will be regulated. The solution that the Government has opted for has been to issue a “skeletal bill”—as the DPRR Committee described it—with powers placed in the hands of regulators and the Secretary of State to plot a course through the unknown.**

85. **We appreciate that the regulatory structure needs to be flexible; it should be able to evolve as technology develops. Flexibility, however, does not preclude parliamentary engagement, debate and scrutiny.** Yet, as the DPRR Committee noted, the Government has “sometimes justified the negative procedure because the ‘detailed and technical’ nature of the regulations make them unsuitable for parliamentary debate”.¹⁵⁰ For example, Schedule 10 includes proposed amendments to the Airports Act 1986 in order “to provide that reference to an aircraft includes a medium-range rocket”. Such amendments are subject to the negative procedure. The Government’s justification for this approach was that:

This legislation offers Parliament the opportunity to consider the public policy issue of bringing these kinds of rockets in scope of aviation legislation. Any subsequent detail in secondary legislation would be detailed and technical in nature, so use of the affirmative procedure would be a disproportionate use of Parliamentary time.¹⁵¹

As a Committee that regularly examines topics that could be described as ‘technical in nature’, from genomics to artificial intelligence, we find it hard to agree with this principle: technical matters are eminently suitable for parliamentary debate.

86. **Furthermore, in order to examine the public policy issues contained in the draft Spaceflight Bill in the depth that is required, it is essential to see the details in order to reach evidence-based conclusions. In many areas, however, it is almost impossible to know just how detailed and ‘technical’ a regulation in the Spaceflight Bill may be because the Government has not provided us with draft regulations.** The Government had planned, before the General Election was called, to consult on both the overarching policy and on detailed content before regulations were brought before Parliament”.¹⁵²

149 Q67 [Stuart Martin]

150 House of Lords Select Committee on Delegated Powers and Regulatory Reform ([SFB0012](#))

151 Department for Transport (Delegated Powers Memorandum) ([SFB0014](#)) p53

152 Department for Transport (Delegated Powers Memorandum) ([SFB0014](#)) p2

While such consultations can prove valuable, they should occur in addition to, not instead of, providing Parliament with the detailed information it needs to scrutinise the primary legislation.

87. Parliament may, for example, wish to debate what level of safety we can expect from ‘spaceflight activities’ before giving assent to a bill that will enable spaceflight to take place from the UK. Yet there is nothing on the face of the draft Bill that provides details on safety, and what will and will not be permitted. Rather, Clause 17 (safety regulations) would simply give “power to the regulator to make safety regulations for the purpose of securing safe operation of spaceports and mission management facilities, spaceflight activities and range for spaceflight activities”.

88. We are concerned by the lack of detail on the face of the draft Bill and the repeated assumption, apparent in the delegated powers memorandum, that technical matters are unsuitable for parliamentary debate. As the Bill currently stands, it would have been very difficult for Parliament to have engaged in meaningful scrutiny of its provisions and its implications for the UK.

89. If the next Government introduces a spaceflight bill it should, at the same time, produce illustrative draft regulations to assist Parliament’s scrutiny of its provisions.

Conclusions and recommendations

Introduction

1. *If the next Government brings forward a bill to enable spaceflight activities from the UK, we would encourage it, for the sake of clarity and consistency, to work with industry to ensure that the terminology used reflects international norms as far as possible. (Paragraph 11)*

Establishing a UK launch capacity

2. Along with the space and satellites sector, we welcome the Government's publication of the draft Spaceflight Bill to pave the way for commercial spaceflight activities to be carried out from the UK. While the Government has set an ambitious timetable for UK launches, which may not be met in practice, the targets are useful in helping to maintain momentum in an area that is vital for UK technology, science and business. (Paragraph 15)
3. Legislating for novel technologies is always challenging. The Government is right to avoid a 'build it and they will come' approach to establishing spaceports. Nevertheless, the current lack of clarity regarding potential launch operators raises questions as to whether the apparent 'legislate and they will come' approach underpinning the draft Bill will prove successful. The absence of quantified costs and benefits in the Impact Assessment makes it impossible to judge how thoroughly the Government has tested the appropriate extent of the financial support it should provide. Making these numbers available only at the secondary legislation stage gives Parliament little opportunity to scrutinise the economic implications of the Bill. (Paragraph 20)
4. *We recommend that, if the next Government introduces a spaceflight-enabling bill, it also publishes a revised Impact Assessment which:*
 - a) *includes a more detailed, monetised cost-benefit analysis; and*
 - b) *provides clear evidence that there are launch operators who are serious about locating in the UK and that legislative change—rather than funding—is what is required to enable them to do so. (Paragraph 21)*
5. There is a risk that the United States' International Traffic in Arms Regulations (ITAR) may inhibit the full development of the UK's commercial spaceflight ambitions and curtail some of its economic benefits. In its response to this report, we ask the next Government to set out how it will address any barriers presented by ITAR, when it expects the matter to be resolved, and what contingency plans it will put in place if an agreement cannot be reached. (Paragraph 25)

Licensing

6. *We recommend that any future spaceflight bill fully clarifies who would need an operator licence and whether licences will be issued on a mission by mission basis. Additional information should also be included in the Explanatory Notes accompanying the bill.* (Paragraph 31)
7. We agree with the House of Lords Select Committee on Delegated Powers and Regulatory Reform that the clauses relating to licensing are of central importance to the draft Bill and that making illustrative regulations available would have assisted our scrutiny. (Paragraph 33)
8. There remains a risk that commercial spaceflight operations using horizontally-launched spaceplanes might not be exempt from European Aviation Safety Agency (EASA) regulations, even with the “experimental” exception allowed for in Annex II of Regulation (EC) No 216/2008. The limited amount of published information from EASA on this matter makes it clear that “limited commercial operations” could require “Restricted Type Certificates [...] issued by EASA”. We are therefore concerned that the Bill has been drafted on the basis that ‘EASA licences’ will not be needed under EU regulations, for so long as the UK remains a member, without any formal agreement with EASA. Further clarity is required to establish where the boundary between ‘experimental’ and ‘commercial’ spaceplane operations lies. (Paragraph 44)
9. *If, as we hope, the next Government introduces a spaceflight bill in the months ahead, we recommend that a memorandum of understanding between the European Aviation Safety Agency (EASA) and the Civil Aviation Authority is signed as soon as possible to cover the period while the UK is still a member of the European Union. This should confirm the conditions under which spaceflight would cease to be deemed ‘experimental’ by EASA and would start to be viewed as ‘commercial’.* (Paragraph 45)

Liabilities, indemnities and insurance

10. Over the past five years, the Government has taken steps to revise the indemnity and liability regime for UK operators to make it more internationally competitive. The draft Spaceflight Bill, however, potentially leaves open the possibility of a return to unlimited indemnities against Government liability being required from UK operators. (Paragraph 50)
11. *We recommend that, in line with the 1986 Outer Space Act, licences issued under a future spaceflight bill must specify the maximum amount of the licensee’s liability to indemnify Government.* (Paragraph 51)
12. Protecting the uninvolved general public from harm arising from commercial spaceflight must be paramount. When incidents do occur, however, it is vital that harmed third parties have recourse to full remedy. We are concerned that clauses 30(5) and 31, as currently drafted, could leave the uninvolved public without full compensation for an incident. *If the next Government introduces a spaceflight bill, it should indemnify claimants for losses exceeding any prescribed limits on operators’ liability, and for any uninsured loss above a licensee’s minimum required level of*

insurance. If the next Government introduces a spaceflight bill, it should indemnify claimants for losses exceeding any prescribed limits on operators' liability, and for any uninsured loss above a licensee's minimum required level of insurance. (Paragraph 55)

13. *If a spaceflight bill is introduced by the next Government, we recommend that the current draft clause 30(2) be revised to ensure that it covers injury or damage caused to a person or to property that is airborne. (Paragraph 60)*
14. *The Government, understandably, is seeking to implement flexible framework legislation because future eventualities are unknown, but it is also planning to grant regulators an indeterminate immunity from claims even as the industry matures and the risks may become clearer. We recommend that, if the next government brings forward a spaceflight bill, it considers granting a further exception to the currently-drafted clause 33 where it can be shown that a future regulator has acted with gross negligence. Provisions should also be included to regularly review the immunity provided under the legislation. (Paragraph 63)*

Order-making power

15. *If the next Government introduces a spaceflight bill with provision similar to the currently-drafted clause 14(4), it should clarify why it is needed and give examples of the purposes for which the Act might be modified. Given the potentially wide ranging nature of such modifications, parliamentary scrutiny is essential and the affirmative resolution procedure should be adopted in any future bill. (Paragraph 68)*
16. *Before any spaceflight bill is introduced, the next Government must address the inappropriate delegations of legislative power contained in the current draft Bill at clauses 21 and 51. (Paragraph 74)*
17. *The powers in clause 29 are very wide, and not subject to any advance judicial scrutiny. The justification offered by the Government is insufficient. In particular, we are concerned about the following aspects of the clause:*
 - a) *the Courts are not involved either before or even, as a matter of course, after an authorisation and the power could be used—however inadvertently—incompatibly with fundamental rights. We have received no explanation why a magistrate could not be found within the month that an authorisation would last, nor even why a magistrate could not be contacted as urgently as the Secretary of State;*
 - b) *the Secretary of State will have power to act unilaterally in relation to potential breaches of treaties (whether or not 'serious'); and*
 - c) *in relation to national security, no explanation has been given for why existing powers available to law enforcement agencies would be inadequate. (Paragraph 79).*
18. *We recommend that if the next Government introduces a spaceflight bill it either removes clause 29 or restricts it to matters of national security and health and safety. If it opts for the latter, we recommend that it provides in the legislation for judicial*

scrutiny at an early stage after the grant of an authorisation, circumscribes carefully the actions which could be taken and reduces to a minimum the period for which an authorisation would be valid. (Paragraph 80)

19. It is clear that the Bill, with its focus on enabling commercial spaceflight from the UK, has been warmly welcomed by industry. We agree that the draft Bill represents an important step towards the UK taking a leading position in the development of commercial spaceflight, especially where small satellites are concerned. (Paragraph 83)
20. The focus now will be on how a future bill will be implemented, and it is here that we have some concerns. A lack of detail on the face of the draft Bill, together with the large number of delegated and wide-ranging powers, reflects the uncertainty about how important aspects of commercial spaceflight from the UK will be regulated. The solution that the Government has opted for has been to issue a “skeletal bill”—as the DPRR Committee described it—with powers placed in the hands of regulators and the Secretary of State to plot a course through the unknown. (Paragraph 84)
21. We appreciate that the regulatory structure needs to be flexible; it should be able to evolve as technology develops. Flexibility, however, does not preclude parliamentary engagement, debate and scrutiny. (Paragraph 85)
22. In order to examine the public policy issues contained in the draft Spaceflight Bill in the depth that is required, it is essential to see the details in order to reach evidence-based conclusions. In many areas, however, it is almost impossible to know just how detailed and ‘technical’ a regulation in the Spaceflight Bill may be because the Government has not provided us with draft regulations. While [Government] consultations can prove valuable, they should occur in addition to, not instead of, providing Parliament with the detailed information it needs to scrutinise the primary legislation. (Paragraph 86)
23. We are concerned by the lack of detail on the face of the draft Bill and the repeated assumption, apparent in the delegated powers memorandum, that technical matters are unsuitable for parliamentary debate. As the Bill currently stands, it would have been very difficult for Parliament to have engaged in meaningful scrutiny of its provisions and its implications for the UK. (Paragraph 88)
24. *If the next Government introduces a spaceflight bill it should, at the same time, produce illustrative draft regulations to assist Parliament’s scrutiny of its provisions.* (Paragraph 89)

Formal Minutes

Wednesday 26 April 2017

Members present:

Stephen Metcalfe, in the Chair

Victoria Borwick Graham Stringer

Jim Dowd Derek Thomas

Chris Green Matt Warman

Carol Monaghan

Draft Report (*The Draft Spaceflight Bill*), proposed by the Chair, brought up and read.

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

Paragraphs 1 to 89 read and agreed to.

Summary agreed to.

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

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

Ordered, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[The Committee adjourned

Witnesses

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

Monday 27 March 2017

Question number

Richard Peckham, Business Development Director, Airbus Group,
Joanne Wheeler MBE, Partner, Bird & Bird, and **Paul Davey**, UK Business
Development Lead, Lockheed Martin Space Systems Company

[Q1–25](#)

Mark Thomas, Chief Executive Officer, Reaction Engines, and **David Ashford**,
Managing Director, Bristol Spaceplanes

[Q26–65](#)

Wednesday 19 April 2017

Stuart Martin, Chief Executive Officer, Satellite Applications Catapult, **Stuart
McIntyre**, Chief Executive Officer, Orbital Access, and **Professor Sir Martin
Sweeting**, Group Executive Chairman, SSTL

[Q66–97](#)

Tim Johnson, Policy Director, Civil Aviation Authority, **Jeremy Stubbs**,
Programme Manager, Commercial Space Operations, Civil Aviation Authority,
Rebecca Evernden, Director of Policy, UK Space Agency, and **Dr Richard
Crowther**, Chief Engineer, UK Space Agency

[Q98–150](#)

Published written evidence

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

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

- 1 Airbus ([SFB0009](#))
- 2 British Interplanetary Society ([SFB0004](#))
- 3 Department for Transport ([SFB0016](#))
- 4 Department for Transport (Delegated Powers Memorandum) ([SFB0014](#))
- 5 Department for Transport (Impact Assessment) ([SFB0007](#))
- 6 Department for Transport (Responses on the Draft Bill) ([SFB0013](#))
- 7 Department for Transport / Department for Business, Energy and Industrial Strategy ([SFB0001](#))
- 8 Glasgow Prestwick Airport ([SFB0003](#))
- 9 House of Lords Select Committee on Delegated Powers and Regulatory Reform ([SFB0012](#))
- 10 Newton Launch Systems Ltd ([SFB0005](#))
- 11 Royal Aeronautical Society ([SFB0010](#))
- 12 UK Space Agency and Civil Aviation Authority ([SFB0015](#))
- 13 UKspace ([SFB0006](#))
- 14 Virgin Galactic ([SFB0011](#))

List of Reports from the Committee during the current Parliament

All publications from the Committee are available on the [publications page](#) of the Committee's website.

The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

Session 2016–17

First Report	EU regulation of the life sciences	HC 158
Second Report	Digital skills crisis	HC 270 (HC 936)
Third Report	Satellites and space	HC 160 (HC 830)
Fourth Report	Forensic Science Strategy	HC 501 (HC 845)
Fifth Report	Robotics and artificial intelligence	HC 145 (HC 896)
Sixth Report	Evidence Check: Smart metering of electricity and gas	HC 161 (HC 846)
Seventh Report	Leaving the EU: implications and opportunities for science and research	HC 502 (HC 1015)
Eighth Report	Setting up UK Research & Innovation	HC 671 (HC 1063)
Ninth Report	Future programme: 'My Science Inquiry'	HC 859
Tenth Report	Managing intellectual property and technology transfer	HC 755
Eleventh Report	Science communication and engagement	HC 162
Twelfth Report	Science in emergencies: chemical, biological, radiological or nuclear incidents	HC 163
Thirteenth Report	Industrial Strategy: science and STEM skills	HC 991
First Special Report	Satellites and space: Government Response to the Committee's Third Report of Session 2016–17	HC 830
Second Special Report	Forensic Science Strategy: Government Response to the Committee's Fourth Report of Session 2016–17	HC 845
Third Special Report	Evidence Check: Smart metering of electricity and gas: Government Response to the Committee's Sixth Report of Session 2016–17	HC 846
Fourth Special Report	Digital skills crisis: Government Response to the Committee's Second Report of Session 2016–17	HC 936
Fifth Special Report	Robotics and artificial intelligence: Government Response to the Committee's Fifth Report of Session 2016–17	HC 896
Sixth Special Report	Leaving the EU: implications and opportunities for science and research: Government Response to the Committee's Seventh Report	HC 1015

Seventh Special Report	Setting up UK Research & Innovation: Government Response to the Committee's Eighth Report	HC 1063
------------------------	---	---------

Session 2015–16

First Report	The science budget	HC 340 (HC 729)
Second Report	Science in emergencies: UK lessons from Ebola	HC 469 (Cm 9236)
Third Report	Investigatory Powers Bill: technology issues	HC 573 (Cm 9219)
Fourth Report	The big data dilemma	HC 468 (HC 992)
First Special Report	Royal Botanic Gardens, Kew: Government Response to the Committee's Seventh Report of Session 2014–15	HC 454
Second Special Report	Current and future uses of biometric data and technologies: Government Response to the Committee's Sixth Report of Session 2014–15	HC 455
Third Special Report	Advanced genetic techniques for crop improvement: regulation, risk and precaution: Government Response to the Committee's Fifth Report of Session 2014–15	HC 519
Fourth Special Report	The science budget: Government Response to the Committee's First Report of Session 2015–16	HC 729
Fifth Special Report	The big data dilemma: Government Response to the Committee's Fourth Report of Session 2015–16	HC 992