Department for Transport

UK SPACE AGENCY

Space Industry Bill: Policy Scoping Notes

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The Space Industry Bill

The UK space industry is a British success story, a growing sector which continues to pioneer new technologies from satellites to rocket engines. There is, however, one area in which our space sector cannot currently prosper: launch. The Space Industry Bill breaks down this barrier to growth by making provision to enable commercial spaceflight activities to be carried out from the UK for the first time. This will include launching small satellites into orbit and permitting manned sub-orbital operations for scientific experiments and space tourism.

The main benefits of the Bill would be to:

- Use commercial spaceflight to support the Modern Industrial Strategy to deliver a stronger economy that works for everyone by generating jobs and putting British business, engineering and science at the forefront of this technology.
- Generate new business opportunities in developing local spaceport and spaceflight technology along with training, tourism and supply chain opportunities.
- Offer the UK's world-leading small satellite companies new options for low-cost, reliable access to space thereby supporting UK companies to compete in the emerging global market for commercial access to space.
- Create new opportunities for the UK's scientific community to carry out cutting-edge research in a micro gravity environment by British scientists easier access to this unique environment by enabling them to launch from UK soil.

Delegated Powers

The Bill contains 100 delegated powers. This large number of delegated powers is required because the commercial spaceflight environment is innovative, highly technical and fast-changing and it is important to have the flexibility given by secondary legislation to adapt to keep pace with this emerging market as both the UK regulators and space industry develop expertise in this area.

The Bill aims to provide sufficient certainty and assurance to Parliament, regulators and the general public, whilst simultaneously having the flexibility to allow industry to grow. A rigid approach would be overly restricting for the space sector.

The main regulation-making powers are in relation to:

- Licensing of space, and sub-orbital activities (including exemptions from the licensing requirement);
- Licensing of spaceports;
- Range, licensing of range control service providers and provision of range control services;
- Power of Secretary of State to appoint a regulator to exercise functions;
- Individuals taking part in spaceflight activities;
- Security, safety, protection of environment and compliance with international obligations;

- Creation of offences and defences in connection with provision made about the matters listed above;
- Civil sanctions;
- Enforcement;
- Appeals;
- Liabilities, indemnities and insurance;
- Rights and controls over land; and
- Charging schemes.

Secondary Legislation

We currently intend to exercise these powers through six statutory instruments:

- Spaceports;
- Space activities;
- Sub-orbital activities;
- Security;
- Insurance, liabilities and offences; and
- Charging.

By grouping powers in this way, we hope to provide clarity for Parliamentarians and potential operators on the regulatory requirements for each type of activity whilst minimising the amount of duplication between the various instruments. All of these statutory instruments, except charging, will be subject to the affirmative procedure and therefore allow full Parliamentary scrutiny.

We currently intend to lay these statutory instruments in Summer 2019, subject to Government priorities and Parliamentary time. This will allow time for more detailed policy development and consultation as well as the drafting of the extensive range of legislation and guidance required. We envisage holding formal consultation on draft regulations in late 2018.

Building on the successful pre-legislative scrutiny of the Bill, we will continue to engage with Parliament, industry and other stakeholders throughout the development of the secondary legislation. This will ensure that the legislation provides the necessary detail to facilitate and support development in the UK space sector, provides potential operators with the confidence to move forward with their plans, whilst also minimising risks to uninvolved third parties and keeping those involved as safe as possible.

To support this process and provide proper scrutiny of the Space Industry Bill, policy scoping notes covering all the regulation-making powers are attached overleaf.

Policy Scoping Notes

Introduction

These policy scoping notes reflect preliminary policy development. They are subject to consultation and the final policy position may differ from that set out here.

Delegated powers have been grouped by clause and there are therefore 37 separate policy scoping notes. Each scoping note:

- identifies the provisions in the Bill that confer the power to make delegated legislation;
- outlines the policy intent of the regulations; and
- outlines the proposed content of the regulations.

In addition, our intended general approach to preparation and timing of secondary legislation is set out in the section above. Where additional information is available, this is provided as part of the individual note.

We intend to publish further information on our approach to secondary legislation prior to Lords Committee.

Clause 2: Duties and supplementary powers of the regulator

Clause 2(7) provides that regulations may prescribe the meaning of "members of the public" for the purposes of any provision of the Bill that refers to public safety, and that the regulations may provide that a person who is voluntarily in close proximity to a source of danger is not a member of the public for any such purposes.

Outline of the policy intent

The primary duty of the regulator, as stated in subsection (1), is securing public safety. "Public safety" is defined in subsection (6) as the health and safety of members of the public and the safety of their property.

The intention is that the power in subsection (7) allows for regulations to define "members of the public" according to the different contexts which regulations will cover (i.e. instead of there being one, fixed definition of "members of the public" stated on the face of the Bill, subsection (7) allows for regulations under this Bill to prescribe the meaning as suits the purpose of each circumstance which regulations may be addressing).

Public safety is referred to throughout the Bill. For example:

- Clause 2(1): duty of the regulator to exercise functions to secure public safety;
- Clause 10(a) requirement for a spaceport licence applicant to have taken steps to ensure risks to public safety are as low as reasonably practicable to enable grant of the licence;
- Clause 25(2)(a) public safety being one purpose for monitoring spaceflight activities etc; and
- Schedule 3 paragraph 5: safety regulations making provision concerning members of the public being denied or permitted access to spaceports or areas within the vicinity of spaceports.

Outline of the proposed content

Regulations will set out in detail the basis on which a person is to be regarded as a member of the public under the different circumstances arising from space activities and sub-orbital activities and the operation of spaceports.

It is envisaged that the term "members of the public" will be defined by excluding persons who are not members of the public, at particular times or in particular circumstances. In most cases, however, "members of the public" would be equivalent to what are often termed 'third parties'.

One set of circumstances in which it will be necessary to describe the persons who constitute members of the public is in relation to distinguishing between persons who voluntarily take part in spaceflight activities in a particular context and those who do not. Definitions of individuals to be regarded as taking part, and thus not as members of the public, will be included in each regulation concerning safety.

<u>Manned spaceflight activities</u>

For the purposes of manned spaceflight activities, those taking part would include:

- crew and other persons who choose to be carried on a spaceflight operation;
- any person with a direct role in preparing the vehicle for launch; and
- any other person voluntarily in close proximity to the launch itself, as provided under subsection (7).

Unmanned spaceflight activities

In the case of an unmanned spaceflight activity, those taking part would include anybody directly involved with the preparation for and operation of the launch of a spacecraft, including in activities such as preparation, integration and fuelling of the spacecraft and surveillance of the range (where this is done directly i.e. with surveillance aircraft).

Spaceport operations

For the purposes of spaceport operations, it will be necessary to make provision for permissible access and denial of access at certain times to certain areas within or in the vicinity of spaceports in order to secure public safety, under the provisions described in Schedule 3 paragraph 5.

The public in this context could include anybody other than those in specific roles who have been granted permission to access certain areas. For example, where hazardous materials are stored and only individuals with certain training and qualifications are permitted access; anybody other than those individuals would be deemed members of the public for regulations governing handling of those materials, even if they are taking part in other spaceflight activities.

It is possible therefore that an individual at a spaceport may be regarded a “member of the public” in relation to their permission to access certain areas at certain times, whilst in relation to specific spaceflight activities they are regarded as ‘taking part’ and thus not a “member of the public”. This varying status of a single individual in respect of different activities and the regulations applying to them, illustrates the necessity of the power under subsection (7).

Clause 3: Prohibition of unlicensed spaceflight etc

Clause 3(5) provides a power for regulations to make further provision for the purposes of clause 3, prescribing eligibility criteria for a licensee and requiring prescribed roles to be undertaken by individuals on behalf of the licensee.

Outline of the policy intent

A person is not permitted to carry out spaceflight activities or operate a spaceport in the UK without a licence granted to that person under clauses 8 (Grant of licences: general) or 10 (Grant of spaceport licence), unless the person is exempted by clause 3(4), by clause 4(1) (Exemptions from licence requirement) or by regulations made under clause 4.

In order to be eligible to hold a licence, the licensee will have to comply with certain criteria and for certain roles to be undertaken by individuals nominated by it on its behalf. The policy intent is to set out the criteria and roles for this purpose in regulations.

Outline of the proposed contents

Subject to consultation, the regulations will prescribe that to be eligible to hold an operator or spaceport licence the licensee must meet the following criteria:

- That it can meet its obligations, established under realistic assumptions, for the first twelve months of its operation and that it can meet its costs for the first three months of operation without any income.
- That it must hold sufficient capital to be able to do this to ensure that there will be a surplus of net assets and sufficient cash for the first twelve months of its operation.
- That any necessary financial arrangements have been executed by the licensee.
- That the persons who will continuously and effectively manage the operations of the licensee are of good repute and that they have not been declared bankrupt.

It is proposed that the regulations will prescribe that the licensee must, depending on whether it is a spacecraft operator or the operator of a spaceport, appoint:

- an accountable manager (both licence types) who will be responsible on behalf of the licensee for all activities and operations conducted by the licence;
- a head of operations (both licence types) who will be responsible on behalf of the licensee for the day to day operations it conducts under the licence;
- a training manager (both licence types) who will be responsible for ensuring staff employed by the licensee in carrying out licensed activities are properly trained;
- an engineering manager (operator licence only) who will be responsible for ensuring craft used by an operator; and
- a safety manager (both licence types) who will be responsible on behalf of the licensee for the development, administration and maintenance of an effective safety management system.

The accountable manager must have the authority to ensure that all licensed activities can be financed and carried out in accordance with the applicable requirements of the licence and regulations made under the powers of the Bill.

Other roles that may be prescribed in regulations in relation to range control services that might be undertaken on behalf of a licensee include:

- Range controller
- Range safety officer
- Range monitoring officer
- Spacecraft tracking officer
- Instrumentation coordinator
- Communications officer
- Disaster control officials
- Countdown controllers

Other roles that may be prescribed in regulations in relation to launch vehicle operators that might be undertaken on behalf of a licensee include:

- Launch decision authority
- Launch director
- Flight controllers
- Fuellers

Clause 4: Exemptions from licence requirement

Clause 4(1) provides a power to make an Order in Council certifying that arrangements have been made between the UK and another country to secure compliance with the international obligations of the UK and, as a consequence, no licence is required.

Clause 4(2) provides a power to make regulations to exempt other activities or persons from the requirement to hold a licence if the Secretary of State is satisfied that a licence is not necessary to secure:

- public safety;
- the health and safety of individuals taking part in a role or capacity that is prescribed under clause 16(1) (Informed consent); or
- compliance with the UK's international obligations.

Clause 4(4) provides that regulations made under subsection (2) may make provision for various matters, including:

- the procedure in connection to granting an exemption, including provision for applications;
- the terms of an exemption or the conditions to which an exemption is subject;
- the revocation or renewal of an exemption; and
- the enforcement of terms or conditions of an exemption.

Further regulations under clause 4(4) may:

- provide that the obligation to indemnify the Government under clause 35 does not apply to a person who is exempt from the requirement of an operator licence; or
- specify the maximum amount of a person's liability to the UK Government in relation to carrying out activities that do not require a licence.

Outline of the policy intent

The Bill makes provision for regulators to licence sub-orbital and space activities and makes it an offence to carry out such activities without an operator licence. The policy intention of subsections (1) and (2) is to provide for circumstances where a person may be exempted from the requirement to hold an operator licence

The first exemption applies where an arrangement has been made with another country whereby that other country will comply with the international obligations on behalf of the UK. The international obligations of the UK include the UN space treaties.

This is based on section 3(2) of the Outer Space Act 1986 ("the 1986 Act") which has a similar provision. That provision was included in the 1986 Act for situations where the UN space treaties make the UK and another state jointly liable for a space activity. This provision allows the UK and the other state to agree between themselves who should supervise the activity. In this situation an Order in Council would be made to provide that a person does not require a licence and such an exemption would apply to a class of activities.

The second exemption is where a person may be exempt from licensing where it is deemed that it is not necessary to licence an activity because that activity would not give rise to safety concerns and would not invoke the UK's international obligations.

The term "operating a space object" or "operating a spacecraft" is intentionally wide to ensure that the Bill captures all activities that are required to be regulated. However, an unintended consequence of this is that it may capture activities that fall within the requirement of a licence but that do not give rise to other concerns (e.g. concerns about compliance with the UK's international obligations). This exemption is replicated from section 3(3) of the 1986 Act.

The third exemption is where the Secretary of State is satisfied that a licence is not necessary in the interests of public safety or to secure health and safety of individuals taking part in spaceflight activities in a role or capacity prescribed under clause 16(1).

It is necessary to provide for matters relevant to granting an exemption and the powers to provide for provisions to be made with regard to the process for a person to apply for an exemption, possible conditions on an exemption, revocation or renewal of an exemption and the enforcement of the terms or conditions of an exemption.

The regulations made exempting that activity may also specify that the requirement to indemnify the Government does not arise or may set the maximum liability of such a person in relation to carrying out those activities. Such an exemption might be appropriate, if for instance, if a person's activity is fully covered by another licence holder's indemnity to Government; or if an activity technically in scope of the licensing requirement would not itself risk causing injury or damage. An example might be a person renting capacity on a satellite that is owned and insured by another licence holder.

However, notwithstanding that a regulated activity satisfies the criteria for an exemption, there is always the possibility that the activity may cause damage and loss to persons and property for which the Government may be held liable under the UN treaties or otherwise. The power in clause 4(4)(f) would allow the Government to exempt an activity but also be protected in the event of a claim, by still requiring an indemnity from the person engaging in the activity. Whether an indemnity is required will depend on the particular circumstances of the activity.

Outline of the proposed content

In relation to an Order in Council exempting activity from a licence due to an agreement with another state, the contents of the order would depend on the nature of the activity. However, we would expect the order to outline:

- That the exemption only applies to a certain activity. Any further activities that are regulated under the 1986 Act or the Bill carried out in conjunction with that other state would still be subject to licensing unless a further order was made.
- The exemption will only apply, in relation to space activities, where the Secretary of State is satisfied that the supervision and monitoring of the activity by the other state is compliant with the UN space treaties and the Secretary of State has had access to and reviewed relevant documentation in relation to this.

- That the other state has ratified the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space including the Moon Treaty and other Celestial Bodies ("the Space Treaty"), the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects launched in Outer Space ("the Rescue Agreement"), the Convention on International Liability for Damage caused by Space Objects ("the Liability Convention") and the Convention on Registration of Objects Launched into Outer Space ("the Registration Convention").
- If the activity relates to the launch of a space object or the in orbit operation of a satellite, that the state has agreed to register the satellite in line with the Registration Convention as a launching state.
- That apportionment of liability in the event of damage as a result of the activities has been agreed with that other state.

In relation to regulations exempting an activity from licensing, again the contents would depend on the nature of the activity to be exempt. However, we would expect the regulations to outline:

- That to obtain an exemption a person would have to make an application. It is proposed that the regulations will set out the procedure to apply for an exemption, including the requirement to fill out an application form and to pay a fee.
- That the exemption only applies to a certain activity. Any further activities that fall under the 1986 Act or the Bill would still be subject to licensing unless further regulations are made.
- Details of the particular activity being exempt (e.g. when the exemption would apply to and any exclusion on the exemption).
- Any conditions to be included in the exemption document on the activity being exempt (e.g. the exempted person may be required to obtain insurance under clause 37). The exempted person may also be required to provide information to the regulator (e.g. about the exempted activity at certain times).
- That whilst the activity may be exempt from licensing, the person may still be subject to a strict liability and therefore required to indemnify the Government. The regulations may set out the level of this liability or state that it is set on a case by case basis depending on the nature of the exemption.

An example of such an exemption to be included within regulations would be a satellite that is being carried to an orbiting space station to then be deployed from that space station into orbit.

It is considered that the carriage of the satellite to the space station as would be considered as procuring the launch of a space object for the purposes of the Bill and the 1986 Act. However, it is considered that such an activity does not require UK supervision by way of a licence because as the object is carried and not being released into the space environment until its deployment off of the orbiting station, the international obligations of the UK would not be invoked. There would be no safety concerns for the Government as the object would be passive and merely being carried. It is important to note that the deployment of the satellite from the orbiting space station, and the subsequent in orbit operation of that satellite would require a licence. This would therefore be a partial exemption from the licensing requirement.

Approach to preparation and timing

It is envisaged that exemptions will be made for a class of activities as and when the need arises.

Clause 5: Range

Clause 5(2) provides a power to make regulations about the range for spaceflight activities, including as to:

- Subsection (2)(a): identifying an appropriate range;
- Subsection (2)(b): operating the range; and
- Subsection (2)(c): notifying persons about activities within the range.

Outline of the policy intent

Establishing a range will be critical to the safe operation of spaceflight activities. Use of an appropriate range will ensure that persons and property are not exposed to unacceptable risk from spaceflight activities and do not pose such a risk to spaceflight activities themselves.

The precise requirements for a particular range will be based on the level of risk presented by the relevant space activity. For example, a full range control service may not be required for some sub-orbital operations or for those parts of an activity that involve a carrier aircraft complying with the rules of the air.

A spaceflight range may extend over several hundred kilometres and cover land and sea owned by many different people. Effective use of the range therefore depends upon informing people of the time and location of spaceflight activities taking place within the range so that the range is clear at the relevant time (i.e. immediately before and during a launch).

Although the Ministry of Defence (MoD) has operated ranges for some time, private civilian ranges for spaceflight activity have not been established in the UK before. There is currently no specific statutory provision for the establishment and safe operation of ranges.

Outline of the proposed content

It is proposed that the regulations will impose particular responsibilities on the range control service provider which must be fulfilled in order for a safe and effective range to operate.

Subsection (2)(a) enables regulations to prescribe matters to be taken into account in identifying the appropriate range. These will include:

- The technical characteristics and operating requirements of the spacecraft for which the range is to be established, including likely flight trajectories.
- Indicative risk calculations and the likely location of associated zones of restriction or exclusion in the range (e.g. around jettisoned rocket fairings or other discarded items).
- The technical requirements for appropriate monitoring and surveillance of the proposed range. For example, regulations may require that a range may not extend beyond an area that the range control service provider is capable of monitoring (though it should be noted that the extent of the range is primarily driven by requirements for safe operation of spaceflight, rather than by technical capability of the range control service provider).

- The nature and extent of likely disruption to other users of land, sea and air in the range area. This would reflect:
    - the population within the range;
    - shipping traffic within the range;
    - air traffic within the range; and
    - any activities likely to be disrupted by activation of zones of exclusion or restriction (e.g. farming and fishing).

Subsection (2)(b) enables regulations to prescribe requirements to be imposed upon on persons in relation to the operation of the range. These requirements reflect the conditions of which the regulator must be satisfied in order to grant a licence (under clause 8) and extend to persons acting on behalf of the range control service provider. The requirements will include those relating to qualifications and experience.

Subsection (2)(c) enables regulations to prescribe persons, or classes of person, to be notified by the range control service provider of spaceflight activities taking place within the range. Those to be notified will include:

- mariners;
- airmen;
- any person with property or an interest in property in the area of the range; and
- the Ministry of Defence.

Where it is likely that members of the public may access land inside the range (e.g. because there is a public right of way in the range), measures will also be required to notify them and, where permitted, to prevent access.

There are extant mechanisms for informing particular categories of person and these will be used for spaceflight activity as for any other potential hazard. Thus, mariners should be notified via a Notice to Mariners and airmen should be notified via a Notice to Airmen. Notices to the public will include visual warnings around the perimeter of the range of the hazardous activities to take place within the range as well measures as specified in Schedule 6.

A range may require a volume of special use airspace (SUA) in the form of a Danger Area (DA) that is segregated from other airspace users. An airspace change process is likely to be required in connection with the establishment of an SUA for a permanent range since this may disrupt the traffic in the affected area. This is an established process managed by the Civil Aviation Authority (CAA) for changing the designation of airspace.

Currently DAs are almost exclusively established to contain defence related activities and the MoD provides regulatory, safety and management oversight of DA airspace on behalf of the CAA. A command level organisation will be required to act as the DA Authority for civilian DA activities. How this command level organisation is identified and authorised is subject to ongoing consultation.

Approach to preparation and timing

There will be workshops in August 2017 with Government stakeholders including MoD (the only Government entity with range capability at present) followed by industry consultation to fully scope

range requirements. The UK Space Agency is commissioning research into the current state of the art and likely evolution of range monitoring and vehicle tracking technologies, which may inform the technical content of regulations.

Clause 6: Range control services

Clause 6(1)(g) provides for a power to make regulations prescribing services to be "range control services" for the purposes of this Bill. The power may be exercised only in respect of certain categories of services, related to matters set out in subsection (2).

Outline of the policy intent

The range control services listed under subsections (1)(a) to (f) are essential to the operation of a range and could be considered the core services provided by any range control service provider.

Additional services prescribed under subsection (1)(g) might not be necessary in every spaceflight operation but could be provided in support of one or more of the core range control services listed under (1)(a) to (f).

The effect of being prescribed as a range control service is that the relevant service could not be performed in support of spaceflight activity without a range control licence. It is considered that the list of services in subsections (1)(a) to (f) is sufficiently comprehensive to define the scope of the range control service. However, based on the Government's current analysis, there is no international precedent for licensing of range control services so experience may require this list to be developed further. It is also important to ensure there is flexibility to refine the scope of range control services to avoid circumvention of the licensing system.

Outline of the proposed content

For the reasons set out above, we do not foresee an immediate need to prescribe additional range control services but the Government considers the power to be a prudent safeguard and anti-avoidance provision, given this is a novel service.

We can, however, be confident in requiring that any further services which may be prescribed under subsection (1)(g) will relate to those matters listed under subsections (2)(a) to (d). For example, an additional range control service, applicable in some but not all circumstances, may be control of the information regime in relation to the range (i.e. ensuring clear data transfer and usability to support range control and ensuring security of data and systems to prevent inadvertent or malicious interference).

Approach to preparation and timing

The Government is taking action to better understand the likely changes to the provision of range control services and how these will relate to the UK's context. Workshops within Government as well as with industry and with regulators from other countries are scheduled which will fully scope out our current requirements and identify which range control services will be subject to change in the coming decades.

For example, the nature of spaceflight and range technologies is evolving and it is likely that autonomous tracking systems will be developed. This could impact on the role of the range control service provider and imply an additional service pertaining to the verification of tracking systems and their interface to other range control systems.

Equally, meteorological information is important for both range control services (and existing air traffic services) because the particular activities that are to be carried out in the range (like air transport) are susceptible to interference from weather conditions. We do not currently think it necessary to require a person simply providing meteorological information to be licensed as a range control service provider. However, this might become necessary if such a person had to, for instance, have access to sensitive information (such as information about technologies).

Clause 7: Provision of range control services

Clause 7 provides for the following powers:

- Subsection (4) provides a power to make regulations to exempt persons or services from the prohibition on unlicensed persons providing range control services.
- Subsection (6) provides a power to make further provisions on various related matters, including:
    - prescribing eligibility criteria;
    - prescribing the circumstances in which, the conditions subject to which and the manner in which, range control services may be performed;
    - requiring prescribed roles to be undertaken by individuals on behalf of the range controller; and
    - restricting a licensee's ability to delegate the provision of services.

Outline of the policy intent

Regulations to exempt persons or services

Providers of range control services will play a key role in ensuring that spaceflight activities are safe and comply with international obligations. The regulator therefore needs to maintain close oversight and assurance that range control services are being provided to the required standards.

It follows that the circumstances in which the Secretary of State may exempt persons from the requirement to hold a licence will be exceptional and that the Secretary of State will still need to be satisfied that safety and compliance with international obligations are secured. In practice, this exemption would only be applied to the provision of a service, or part of a service, by a party other than the principal range control service provider, in the circumstances where that aspect of the service was either:

- not deemed critical to safety or compliance with international obligations; or
- was regulated already under other regulations and deemed to be of acceptable standard for range control service provision.

For example, there may be a service prescribed under clause 6(1)(g) concerning the scheduling or planning of activities (see previous note). Aspects of this may address the operational efficiency as opposed to safety and thus, if they were conducted by a separate person, it would be unnecessarily onerous to require a separate licence.

As another example, a service may include the provision of cameras to monitor launch and flight of a spacecraft, in order to monitor performance to improve spacecraft design, rather than for safety. In this instance, where the cameras and the associated communications are provided by another person to a standard that is acceptable to the regulator, it would be unnecessary to require a separate licence.

Similarly if a person is already providing a service for meteorological data as an approved provider for a regulated aerodrome and the regulator is assured that this meets equivalent or more stringent

requirements than those under this Bill, an exemption from licensing the provision of this discrete service under this Bill may be applied.

It should be noted that any such exemption does not exclude the person from appropriate scrutiny: an exemption will only be granted if the regulator can be assured that the same standards as required for a licence are met.

Regulations to make further provision

Subsection (6)(a) allows regulations to prescribe eligibility criteria. The regulator will use eligibility criteria in considering whether an applicant should be licensed to provide range control services. As this function is a safety and security critical function, licensed persons need to be both competent and trustworthy.

Subsection (6)(b) allows regulations to make provision for a range control service provider and a vehicle or spaceport operator to be the same person. The conditions which would be applied in such a circumstance would be intended to assure a clear delineation of responsibilities between the range control and the relevant operator functions. The regulator will need to satisfy itself that the overarching responsibility of the range controller to coordinate safety critical operations is not compromised and is ensured.

Subsection (6)(c) allows regulations to make provision to ensure the independence of certain roles within spaceflight activity from roles in range control. This will be of particular relevance where the range controller and the operator are the same (legal) person, as allowed by regulations under subsection (6)(b). This is to ensure that no individual has conflicting responsibilities.

Subsection (6)(d) enables regulations to make provision on related aspects of range control service provision in order to ensure that best practices are widely adopted, as and when they become settled.

Subsection (6)(e) allows regulations to prescribe certain roles that must be performed in the course of providing range control services. This will ensure that certain safety-critical roles are established by the range control service provider. Critical roles will thus be ‘owned’ by an individual who may have specific statutory functions and duties prescribed in regulations.

Subsection (6)(f) allows regulations to restrict the ability of a range control service licence-holder to delegate the provision of those services. This is intended to ensure:

- that the range control licensing regime is not circumvented, with unregulated persons performing safety or security critical functions or insufficient resourcing;
- that mandatory observation reporting is undertaken to ensure that concerns related to failures or defects are shared with all relevant parties in a timely manner; and
- where relevant, effective interaction with and information sharing between the range control service licence-holder, spaceport operator and launch operator.

The remaining powers in subsections (6)(g) to (j) enable detailed provision to be made about procedural matters and ancillary matters relating to exemptions.

Outline of proposed content

As regards regulations under subsection (6)(a), the eligibility criteria prescribed will include:

- financial eligibility;
- fitness of directors;
- fitness of those in prescribed roles (under subsection (6)(e));
- technical capability; and
- security clearance where necessary (e.g. to work with classified data or data sources).

As regards regulations under subsection (6)(b), the circumstances in which a person would be authorised to provide both range control services and other spaceflight activities will include:

- where there is a compelling commercial case for the integration of these activities in one company; or
- where there is no alternative available on the market.

The conditions under subsection (6)(b) would be used to ensure that no conflict of interest threatens the safe provision of the range control services. They will include:

- clear separation of chains of command between the provision of range control services and provision of other spaceflight activities; and
- conditions on the information which must be exchanged between the parties and information which must not be exchanged.

The specific details and relation of these conditions will depend on which functions the person is undertaking and the nature of the operations to which they pertain.

As regards regulations under subsection (6)(c), the same approach to avoiding any conflict of interests will apply. For example, whilst the same company might provide range control and launch services, subject to the conditions under subsection (6)(c), no individual within that company will be permitted to carry out a role for the provision of range control services and a role for the provision of spaceflight activities in relation to the same activity.

As regards regulations under subsection (6)(d), the aspects which will be addressed will likely include:

- safety management systems: the organisational structure, policies, procedure and accountabilities for ensuring safety;
- command and control functions: the systems by which range control service provider establishes authority and control over the relevant areas;
- surveillance and tracking: of the vehicle and the area of the range; and
- notification and, where relevant, enforcement of warnings, restrictions and exclusions.

As regards regulations under subsection (6)(e), the prescribed roles to be undertaken by individuals will include but not be limited to:

- Range controller, having responsibility for overseeing and coordinating the different range functions;

- Range safety officer, responsible for the safety management system and overseeing all the range operations to ensure that risk is managed to a level that has been agreed with the regulator as being as low as reasonably practicable. The range safety officer will under certain circumstances, have authority to advise the launch director to terminate a flight. The range safety officer will also have authority to abort a countdown prior to ignition of the main engines;
- Range monitoring officer, responsible for the monitoring and surveillance of the range and assuring the range safety officer that the range is sufficiently cleared for a given operation, or else notifying the range safety officer and the launch operator of any breach; and
- Vehicle tracking officer, responsible for agreeing the planned trajectory and monitoring the vehicle tracking systems and notifying the range safety officer of any deviation from the planned trajectory.

As regards regulations under subsection (6)(f), these will be informed by consultation with other Government departments and industry, and ultimately the nature of specific operations may vary significantly in size and complexity. The following services, however, are so integral to securing the safe operation of a range that the regulator is likely to impose restrictions prohibiting the range control service provider from delegating them:

- identifying an appropriate range for particular spaceflight activities;
- co-ordinating arrangements for the activation and operation of the range;
- obtaining all necessary information for identifying the range and for coordinating its activation and operation; and
- ensuring that notifications are issued for the protection of persons who might be put at risk by spacecraft or carrier aircraft within the range or in the vicinity of it.

Approach to preparation and timing

Our approach will be the same as that set out in the note for clause 5.

Clause 8: Grant of Licences: general

Clause 8(5), (6) and (7) provides that regulations may make provision about how applications for licences are to be made, considered and determined. The regulations may in particular prescribe, or provide for a person responsible for determining an application to specify:

a) the form and contents of an application for a licence;
b) information to be provided in connection with an application;
c) the procedure for rectifying procedural irregularities; and
d) time limits for doing anything required to be done in connection with an application and the procedure for extending any period so prescribed.

The regulations may also provide for:

e) the inspection of sites, facilities, equipment, spacecraft, carrier aircraft and other vehicles; and
f) the obtaining of information (whether by inspecting documents, interviewing individuals or otherwise), by prescribed persons or persons of prescribed descriptions.

This clause applies to all licences to be granted under the Bill. There are specific requirements for operator licences: safety (clause 9), spaceport licences (clause 10) and range control licences (clause 7).

Outline of the policy intent

These powers provide for administrative and procedural matters relating to a licence application. The policy intent for the regulations is to set out in detail how an applicant should apply for a licence, what information they should provide in connection with that application, what procedures will apply during the application process, relevant time limits, what sites and facilities may be inspected by the regulator and what information may be required in connection with a licence application and from whom.

Outline of the proposed content

<u>a) The form and contents of an application for a licence</u>

It is proposed that regulations will require that the application form will:

- Be in writing and in such form as the regulator may specify;
- Contain the official name and business name, address, and mailing address of the applicant;
- Contain a description of the proposed operation, including the type(s), and number of carrier aircraft and spacecraft to be operated and in the case of range control services, the services to be provided;
- Contain a description of the proposed operating area(s), spaceport site and, in the case of range control services, the site from where the services will be provided;
- Contain the names of the nominated persons required by regulation together with their qualifications and experience; and

- Contain a statement that all the documentation sent to the competent authority has been verified by the applicant and found in compliance with the applicable requirements.

This list is not exhaustive and the Secretary of State or the regulator responsible for determining the licence application may vary or add to the requirements. The power in subsection (6) contains this necessary administrative flexibility for the regulator which will enable the administrative process of licence application to be updated and improved without recourse to prescribing by regulation.

(b) Information to be provided in connection with an application

Subject to consultation, the regulations will require that the licence applicant shall provide the following information to the regulator:

- Proof of third country licence (if applicable);
- Proof of export licence (where applicable) or information relating to the application of the export licence;
- A description of the management system;
- Copies of relevant manuals (e.g. the operations or spaceport manual, training manual, maintenance manual, etc);
- A system safety assessment of the spacecraft;
- A Certificate of Airworthiness (or other CAA permission) for any conventional aircraft used
- Casualty analysis calculations;
- Compliance with any statutory security requirements or relevant directions made pursuant to clause 27;
- Details of key postholders, including any criminal convictions and previous bankruptcies
- Any technical information that is required as part of the application form; and
- Copies of insurance policy documents where applicable.

Not all of this information will be available and complete at the time an application is made. Regulations may set out that a regulator can accept an incomplete application if this is deemed appropriate and there is enough information supplied to advance the application. Any time limits contained in regulations imposed on the regulator to consider an application will only be applicable upon receipt of a full licence application.

It is proposed that regulations will also require an applicant to demonstrate to the regulator that:

- Its organisation and management are suitable and properly matched to the scale and scope of the operation.
- It has the financial and technical resources to carry out the activities authorised under the licence.
- The persons who are expected to carry out, on the applicant's behalf, any of the activities authorised by the licence are fit and proper persons to do so.
- It has met the requirements that are to be prescribed under powers in clause 9 concerning risk assessments.

Again, this list is not exhaustive and the Secretary of State or the regulator may vary or add to the requirements exercising the administrative power in subsection (6).

c) The procedure for rectifying procedural irregularities

It is proposed that the regulations will provide for a process to extend the period mentioned below if irregularities that require rectification are found. The regulations will also provide that the regulator may waive any procedural irregularity in a licence application which it thinks is not material to the regulator reaching a decision.

d) Time limits for doing anything required to be done in connection with an application and the procedure for extending any period so prescribed

Determining an application for airline certification licensing can take 6 months or more, depending on the complexity of the application. For licences issued under the Outer Space Act 1986, applicants are requested to allow at least 6 months for their licence to be processed. For bespoke or non-standard missions, applicants are asked to contact the UK Space Agency as soon as they can with regard to their mission.

Licence applications for spaceflight activities will probably take longer than 6 months due to the novel and bespoke nature of the activities. It is proposed therefore that regulations will propose in the case of an application for a standard operation:

- a formal period of pre application consultation (likely to be between 6 to 12 months, although this may be reduced if the applicant already holds an operating licence issued in a foreign country in respect of which there is a "relevant agreement" in respect of which regulations have been made pursuant to clause 64 or the foreign country is a designated country under clause 12(4));
- the regulator to issue a licence within 6 to 12 months of the receipt of a completed application and payment of any applicable charges;
- a process to extend the 6 to 12 month period if irregularities that require applicant rectification are found, (the extension period to be agreed with the applicant or if not agreed, as determined by the regulator not exceeding a further 6 months); and
- that the applicant shall be informed if the application is rejected. The reasons for the rejection to be confirmed in writing along with information relating to the right of appeal.

e) Inspection of sites, facilities, etc

It is proposed the regulations will require an applicant to make access available to:

- any site where spacecraft to be used in the applicant's operations are assembled or made;
- any site where control and navigation equipment to be used in the spacecraft are assembled or made;
- the carrier aircraft and spacecraft to be used in the applicant's operations;
- any other vehicles that the regulator determines it needs to inspect in order to determine whether to grant the application (the carrier aircraft will require adaptation to carry a spacecraft, so is an obvious example).

It is proposed that access will be required to be granted to:

- the regulator and its inspectors;

- to persons assisting with the performance of the regulator's safety functions under clause 20;
- to persons providing advice and assistance under clause 62;
- to other public authorities under clause 63;
- to relevant experts appointed by the regulator; and
- to the representatives of other States where regulations under clause 12 or clause 64 have been made.

f) The obtaining of information

It is proposed that the regulations will require an applicant to supply evidence to enable the regulator to determine the application.

The regulator will require originals or certified true copies of documents for inspection. Documents may include certificates, licences, accounts, manuals, records and so forth, relevant to the nature of the licence application.

It is proposed that regulations will permit the regulator or its representatives to interview persons for the purposes of obtaining information relevant to the application and will include a non-exhaustive list of such persons who may be interviewed. These will include:

- flight and ground crew;
- key personnel of the applicant, such as the operations director, range controller, etc;
- representatives of the applicant's training providers;
- representatives of the spacecraft manufacturer; and
- representatives of applicant's spacecraft maintenance organisation.

Any list of information to be provided, or persons to be interviewed, set out in secondary legislation will be non-exhaustive because it is not possible to anticipate every case in advance. Information will be required to be supplied in writing but the regulator may require persons to provide information under interview where the written information is insufficient.

Clause 9: Grant of operator licence: safety

Clause 9 makes provision in respect of safety considerations when an operator licence is sought. This includes the following powers to make delegated legislation:

- Subsection (2) provides a power to prescribe certain roles or capacities, within the activities to be authorised by the licence, for which a risk assessment must be completed.
- Subsection (3) provides a power to prescribe the requirements of such a risk assessment.
- Subsection (5) provides a power to make regulations about:
    - Matters to be taken into account and other requirements to be met in carrying out risk assessments.
    - The steps that must be taken by the applicant to ensure that the risks to third parties (i.e. those who are not in prescribed roles and capacities) are as low as reasonably practicable (this is the "ALARP" test, familiar in health and safety legislation).
    - How "acceptable" levels of risk to third parties are to be determined, for the purpose of the clause.
- Subsection (6) provides a power to make regulations requiring information to be provided to the regulator.

Outline of the policy intent

This clause provides for key safety assessments which must be carried out prior to the grant of an operator licence.

The purpose of the powers in subsections (2) and (3) is to identify the persons who will be engaged in the most high risk activity and set standards for the risk assessment the operator must carry out for such persons.

The subsection (2) risk assessment will also allow individuals who are subject to informed consent requirements in clause 16 to understand the level of risk involved in the relevant activities, so as to be able to make an informed choice as to whether they wish to participate or not.

In respect of other third parties, the primary legislation sets minimum requirements in subsection (4) and the accompanying powers in subsection (5) enable secondary legislation to develop how these requirements may be met.

Finally, the information power in subsection (6) provides the necessary regulatory tool to ensure the assessments can be reviewed in a meaningful way.

The proposed content of the regulations will be influenced by two overarching considerations:

- Alignment to existing spaceflight industry standards. It is expected that, initially, almost all vehicles will be registered in the US and therefore will have to comply with US laws (although we shall also update in the light of best practice more generally as it evolves at the international level or in other states); and

- Alignment to best practice for managing risk across all sectors in the United Kingdom.

Outline of the proposed content

It is proposed that the regulations will prescribe which roles or capacities must be the subject of a risk assessment as defined in subsection (2). These will relate to the crew directly operating a sub-orbital spacecraft and carrier aircraft; the ground crew involved in the operation of spacecraft (orbital or sub-orbital); and any other participant on board the spacecraft and carrier aircraft following launch, in whatever capacity.

The regulations made pursuant to subsection (3) will prescribe the matters that must be taken into account and key areas that an operator must assess when carrying out a risk assessment for prescribed persons and roles, as follows:

- The risk assessment must be suitable and sufficient to determine the risks to the health and safety of individuals taking part (in the prescribed roles or capacities) in the activities to be authorised by the licence. Suitable and sufficient is not defined in law but would include:
    - whether a proper check was made of all the relevant factors;
    - whether people who might be affected were consulted; and
    - whether significant hazards have been considered and the risks arising from them controlled to a level as low as reasonably practicable.
- It will be a prescribed requirement under subsection (3) that an operator will have to demonstrate that the risks to individuals taking part in spaceflight activity in a prescribed role or capacity have been managed to a level that is as low as reasonably practicable. ("ALARP"). This is a familiar concept in health and safety law, providing a benchmark for risk assessments under sections 2 and 3 of the Health and Safety at Work Act 1974[1].

The prescribed roles and capacities for the purposes of subsection (2) will be those of pilots, other crew on board the spacecraft and other persons travelling on board the spacecraft but not involved in the operation of it. These would include fee paying participants and persons conducting scientific experiments.

Regulations made under subsection (3) will require a risk assessment to take account of at least the following issues:

- The design and operation of the spacecraft involved in space activity or sub-orbital activity;
- Failure rates of the spacecraft the operator is proposing to operate, or similar spacecraft where there are no such recorded failure rates for it;
- The licensing, flight training and requirements for crew on board the spacecraft and carrier craft;
- The training and procedures for ground personnel and occupants on board the spacecraft;
- Occupant safety and survivability; and
- Medical requirements for crew and other occupants of the spacecraft.

Steps to be taken under subsection (4)(a) and prescribed under subsection (5)(b) may include (but not be limited to) the following:

[1] http://www.hse.gov.uk/risk/theory/alarpglance.htm

- The trajectory selection should take into account optimal routing to avoid population centres;
- The operator must have a suitable emergency response plan in place;
- Suitable separation distances between vehicle operations and the general public must be determined;
- Suitable notification procedures should be in place to give advance warning of the intended spaceflight operation;
- Suitable security arrangements at the spaceport must be in place to keep members of the public off the launch site and any restricted areas;
- Rescue and fire-fighting services at the spaceport must be alerted to the launch;
- Data concerning previous launch and flight failures and incidents must have been analysed and taken into account in relation to the proposed launch and flight.

The regulations under subsection (5)(a) will prescribe the factors that must be taken into account in determining levels of risk. These will include:

- The hazards posed by the proposed operation;
- The areas that could be affected by debris from a spaceflight failure; and
- Failure frequencies or probabilities.

The regulations under subsection (5)(c) will provide how levels of risk to the uninvolved public will be calculated. Operators will need to calculate the level of risk based on a methodology on expected casualty rates. The regulator will publish the methodology, which may be used by the licence applicant as a means of compliance with subsection (5)(c). It will be open to an applicant to suggest an alternative means of compliance but the regulator must be satisfied that it offers an equivalent level of protection for the public. This system is used by the CAA in its regulation of civil aviation. The UK Government is currently working with the UK Health and Safety Laboratory (HSL, part of the Health and Safety Executive) to develop a comprehensive methodology for the assessment of the individual risk to 3rd parties per annum from space operations from a UK location.

The regulations under subsection (6) will require the applicant to provide detailed plans showing how it has taken into account the specifics of the intended or expected operation from the intended spaceport and how it intends to mitigate risks to those persons not participating in a prescribed role under subsection (2) (i.e. the uninvolved public) to ALARP.

The regulations under subsection (6) will prescribe such information as is required to enable the regulator to be satisfied as to the risk assessment under subsection (2) and to be satisfied that the applicant has taken all reasonable steps to ensure risks to persons not involved in the spaceflight activity are as low as reasonably practicable and that the levels of those risks are acceptable. This information will include:

- Relevant technical information related to the design and operation of the spacecraft;
- Relevant performance information related to the space spacecraft;
- All relevant flight test results;
- All relevant records of anomalies, incidents and accidents during flight operations;

- All relevant information to assess the risk to the health and safety of individuals taking part in the activities;
- All relevant information to assess the risk to the health, safety and property of individuals not taking part in the activities;
- All relevant records of training and medical assessments completed; and
- All other relevant documentation that the regulator should reasonably expect to be able to carry out its functions under this section.

Clause 10: Grant of spaceport licence

Clause 10(b) provides that the regulator must not grant an application for a spaceport licence unless satisfied, inter alia, that any prescribed criteria or requirements are met.

Outline of the policy intent

The regulations to be made under clause 10(b) will prescribe the criteria and requirements which must be satisfied in order for the regulator to grant a licence application. This will provide a clear regulatory framework for the industry and the regulator to follow.

Outline of the proposed content

General

In broad terms, three types of licensed spaceport are envisaged:

- A facility for operating horizontally-launched spacecraft for sub-orbital operations, single stage to orbit and hybrid orbital operations ("a horizontal operations spaceport");
- A facility for operating vertically-launched spacecraft for orbital or sub-orbital operations ("a vertical operations spaceport"); and
- A facility for the take-off of stratospheric balloons ("a stratospheric balloon spaceport").

Whilst many criteria will be common across different types of spaceport, the different characteristics of each type of licensed spaceport mean that the prescribed criteria and requirements will vary. So the requirements are described below for each, although many criteria will be common across the different types.

The grant of a spaceport licence will not necessarily require a specific vehicle operator to be identified. A site may be granted a spaceport licence with conditions permitting certain types of operations. This may be commercially advantageous to a spaceport operator wishing to demonstrate to vehicle operators that they are 'open for business'. Alternatively, a site may apply for a licence with a specific vehicle, or vehicles, in mind. This would simplify the licence application and assessment process: there would be a greater degree of certainty about the required standards, and thus fewer conditions attached to the licence when issued. We do not intend to preclude either approach; our initial plans for the licensing process do not impose any unnecessary dependencies between licence types.

Horizontal operations spaceports

The Secretary of State proposes to exercise the power in clause 15(1) to appoint the Civil Aviation Authority (CAA), inter alia, as the regulator for the purpose of granting a horizontal operations spaceport licence. The CAA is already the regulator for existing aerodromes.

For horizontally-launched spacecraft and operations involving a carrier aircraft that require the use of a runway, the take-off will be from either:

- a European Aviation Safety Agency (EASA)-certified aerodrome, that has obtained a horizontal operations spaceport licence;
- a CAA-licensed aerodrome, that has obtained a horizontal operations spaceport licence; or
- a military aerodrome[2].

The requirement for an aerodrome certificate or licence for the site to be used as a horizontal operations spaceport reflects the fact that a long runway is required for horizontal launches and thus most sites with such a runway are already certificated or licensed and that many of the requirements for a conventional aerodrome are similar if not the same as for a horizontal operations spaceport.

In broad terms, the requirements for horizontal spaceports will be:

1. a requirement to have either an EASA aerodrome certificate[3] or a UK national aerodrome licence[4] for the spaceport site;
2. a requirement to review the aerodrome regulatory requirements that currently apply under the certificate or licence in relation to the proposed space activity, in order to demonstrate that the risks associated with space operations from that aerodrome can be managed effectively; and
3. any additional requirements beyond those mandated by the current aerodrome regulatory frameworks.

As to the first of these requirements, the EASA and UK regimes both lay out a similar regulatory framework, based on International Civil Aviation Organisation (ICAO) standards and recommended practices for the licensing of aerodromes in Annex 14 (Aerodromes) to the Chicago Convention. The requirements that an aerodrome must meet are dictated by the size and performance characteristics of the aircraft, the type of operations being conducted and the conditions in which the operations will take place. These include those relating to safety management systems, physical characteristics, obstacle limitation surfaces, rescue & firefighting services, birds & wildlife, runway & taxiway inspections, signs, markings & lighting, emergency response plans, personnel training and security. As such, these regimes are flexible and proportionate and therefore we will adopt a similar approach for the licensing of spaceports.

As to the second of these requirements, the applicant will have to review the various arrangements that it has in place to meet current EASA and UK national standards in order to determine what changes or additional arrangements are necessary to enable safe spaceflight operations of the type contemplated. This review would include:

- a management of change and review of physical infrastructure process;
- a full review of the aerodrome safety management system;

[2] A military or Government aerodrome may not comply with EASA or CAA aerodrome licensing rules. Further discussions are required with the Military Aviation Authority if a military aerodrome intends to support commercial space operations.
[3] i.e. one granted under Commission Regulation (EU) No 139/2014 of 12 February 2014 laying down requirements and administrative procedures related to aerodromes pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council.
[4] i.e. one granted under article 212 of the Air Navigation Order 2016 (S.I. 765/2016).

- a full review of the aerodrome emergency response plan;
- the production of an integration plan, demonstrating how the proposed space activities at the spaceport will be integrated with other aviation activity conducted at the aerodrome or, if required, segregated from them. (This will be of particular importance in relation to any essential services conducted from the aerodrome, such as search and rescue flights, police service flights, medical evacuation flights, etc); and
- assurance that security regulations have been complied with, including as regards both physical and cyber security of the facilities.

As to the third of these requirements, there are two additional matters that an applicant would be required to satisfy in order for the CAA to be able to issue a horizontal operations spaceport licence. These are:

- Flight safety analysis: An assessment of the proposed space activity, such as the spacecraft flight profile and trajectory and spacecraft or carrier aircraft characteristics such as failure rates, to calculate the risk to third parties, on the land, at sea and in the air, from operations at the proposed spaceport site. See clause 9 (Grant of operator licences: safety); and
- Explosive site plan: An assessment of the potential risks posed by the storage, use and handling of any new propellants and substances required for the proposed space operation. The explosive site plan must conform to the requirements of the Control of Major Accident Hazards Regulations[5] and the regulator must be satisfied that the hazard from dangerous substances has been reduced to as low as reasonably practicable.

The flight safety analysis will be used to assess and determine if the applicant meets the test under clause 10(a).

<u>Vertical operations spaceport</u>

The Secretary of State proposes to, through the UK Space Agency (UKSA), act as the regulator for the purpose of granting a vertical operations spaceport licence. UKSA is already the regulator for existing space activities licensed under the Outer Space Act 1986.

For vertical operations spaceports, there will be no requirement that the site is an existing EASA-certified or nationally-licensed aerodrome because vertical operations do not require a runway. Regulations made under clause 10(b) will therefore prescribe the full range of criteria to be assessed when a licence application is made.

These will include requirements as to:

- The physical characteristics and infrastructure of the spaceport;
- A full review of services at the spaceport associated with space activity. These include clean room and payload fuelling areas, staging areas for mechanical and electrical system checkout and assembly operations;
- The safety management system for the spaceport;
- The emergency response plan for the spaceport;

[5] S.I. 483/2015

- Provision of airspace management, flexible use of airspace, and air traffic services in the vicinity of the spaceport;
- Assurance that security regulations have been complied with, including as regards both physical and cyber security of the facilities;
- A flight safety analysis; and
- An explosive site plan.

So far as physical characteristics and infrastructure are concerned, an applicant will be required to complete a review of the site, assessing whether the physical infrastructure, facilities, equipment and support services are suitable for the particular vertical operations contemplated. These will also include measures used to protect sensitive information or equipment from unauthorised persons in accordance with international obligations such as the International Traffic in Arms Regulations. The outcome of that exercise will be provided to the UKSA who will assess whether it provides sufficient mitigation of the potential safety and security hazards of the proposed activity.

So far as the safety management system is concerned, the regulations may provide for requirements that equate to the standards set by other regulatory bodies (for example, CAA, HSE, devolved administrations, Environment Agency, local authorities, etc) but each will be reflected in a comprehensive safety management system, without which a licence may not be issued. This will cover site casualty analysis, ground infrastructure, site security, personnel, cybersecurity, physical protective measures, staff safety training, physical launch infrastructure, launch pad, rescue and firefighting, emergency response plan, environmental & planning assessment, hazardous fuel storage, nitrogen, cryogenic and other fuel storage, safety training offices, facilities and general health and safety, explosive storage, data feeds, fuel handling & pressurisation, clean room, integration & payload fuelling, staging area for mechanical & electrical system checkout, assembly operations, concrete launch pad & cover and tower & gantry with umbilical services.

So far as the emergency response plan is concerned, this must set out how an emergency situation or incident involving a spacecraft, at the site or nearby (including at sea), would be managed effectively in order to minimise the effects it may have on life, property and spaceport operations. Details such as the level of rescue and firefighting equipment and services required will depend on the type of spacecraft proposed and the type and amount of propellant used.

So far as flight safety analysis and an explosive site plan are concerned, these will mirror the requirements for horizontal operations, as described above.

Furthermore, the relationship between range control services and the spaceport will be critical for vertical launch facilities since the spaceport itself will necessarily be within the range area. Regulations will therefore also require that a spaceport licence application must identify:

- The range service provider (whether they have been granted a licence yet or are in the process of applying for one); and
- The type of operation that is planned for (either in terms of the generic type of operation or the specific vehicle and vehicle operator).

The interfaces between these organisations must be identified and appropriate agreements in place for inspection by the regulator.

Facility for the take-off of stratospheric balloons

The facility required for a stratospheric balloon will depend on the type and size of balloon, the services required to support the operation of the balloon and the area of planned operation. Stratospheric balloon operations for spaceflight activity are comparatively new and will carry their own different set of risks. Until we fully understand the technology and its modes of operation then we cannot at this stage state in detail what the spaceport licence requirements will be. However, we would expect the operation to fulfil all the same safety requirements as for other space activity and this would also apply to any balloon spaceport.

Clause 12: Conditions of a licence, including Schedule 1

Clause 12(1) and Schedule 1 make provision for a wide range of licence conditions.

Clause 12(3) provides that regulations may require certain conditions to be included in licences in particular cases or circumstances.

Regulations may provide for the regulator, in deciding what conditions to include in a licence under this Bill, to accept or recognise:

- a licence, authorisation or approval, under the law of a designated country outside the United Kingdom, concerning a matter that is relevant to the regulator's decision; or
- the outcome of any process undertaken in connection with an application for any such licence, authorisation or approval.

In this subsection "designated country" means a country specified in the regulations or (if the regulations so provide) designated by the Secretary of State in accordance with the regulations.

Clause 12(7) provides a power to make regulations prescribing how the holder of a licence may or must comply with prescribed kinds of licence conditions.

Outline of the policy intent

Spaceflight and associated activities will be authorised by way of a licence. The powers in this clause and Schedule 1 mean that licences can be tailored to the activity to be authorised but also ensures that licences contain any mandatory conditions.

The Bill also makes provision to enable an existing commercial spaceflight approval, authorisation or licence issued, or the outcome of any associated process for their issue, by another country to be accepted or recognised by the regulator in deciding what conditions to include in a licence under the Bill. The purpose of this power is to enable the UK to selectively accept or recognise all or part of other States' spaceflight regulatory processes provided it has confidence in the robustness and adequacy of those processes. This power is advantageous for both the UK and the commercial spaceflight industry. When the power is applied it reduces the need for duplicated effort for compliance demonstration activity already undertaken which may have a positive impact by reducing regulatory resource requirements, costs and administrative process.

Outline of the proposed content

Schedule 1 provides a non-exhaustive list of conditions that might be applied to a licence. The actual conditions will vary depending on the type of operation planned and the type of licence issued. Conditions include:

- conditions that are generic to all licence holders;
- conditions specific to a type of licence such as operator's licence or spaceport licence; and
- conditions that are specific to a particular licence only that may put limitations on the licence holder in its use of that licence.

It is proposed that the regulations will prescribe those conditions that are mandatory for certain spaceflight activities and must be included in licence conditions. Subject to consultation, this could include:

- that the licensed activities will be conducted in accordance with best practice in the space industry and in compliance with the laws of the UK and obligations of the UK under international law;
- the licensee shall not prejudice in any way the national security of the UK;
- the licence will set out the licensee's indemnity to the UK Government.; and
- the licensee will inform the regulator of any event or occurrence which could give rise to an insurance claim.

It is proposed that the regulations will:

- prescribe which countries' are designated for the above-mentioned purposes;
- empower the Secretary of State to designate other countries for this purpose; and
- prescribe what licences, authorisations or approvals may be accepted or recognised or the outcome of any application process for the issue of same.

In relation to a generic condition such as paragraph 21 of Schedule 1, the regulations may prescribe what notice and what information or documents the regulator must receive before the meeting and that it should receive a minute of the meeting.

In relation to a more operation specific condition, such as paragraph 29 of Schedule 1, the regulations may prescribe that the persons involved in the licensed spaceflight activities may comply with the qualification condition by either obtaining a licence or approval from the regulator or an equivalent licence or approval from a designated country.

Another example would be paragraph 7 of Schedule 1, in which the regulator may limit the operation by placing conditions on the licence that would restrict the operator to using specific flight profiles in certain directions only. This may be needed to ensure the operation is conducted away from centres of population.

Where a licensee is required to hold a certain level of insurance for the duration of the licensed activities (e.g. operation of a satellite in orbit), they may be required to provide copies of insurance policies and documents for review on annual basis in advance of the expiry of the insurance.

Clause 15: Power of Secretary of State to appoint person to exercise functions

Clause 15(1) provides a power for the Secretary of State to make regulations appointing the Civil Aviation Authority (CAA) or another person to exercise functions of the regulator. The appointments may be:

- to exercise a function for a particular purpose, in relation to particular activities or services of areas;
- to exercise a function concurrently with the Secretary of State or instead of the Secretary of State;
- subject to conditions; and
- for a particular period.

Outline of the policy intent

The Secretary of State is the initial regulatory authority for commercial spaceflight in the Bill. However, it is the Government's intention:

- to appoint the CAA to perform certain functions instead of or concurrently with the Secretary of State; and
- that the United Kingdom Space Agency (UKSA), an executive agency of the Department for Business, Energy and Industrial Strategy, will carry out the functions of the Secretary of State unless delegated to the CAA.

It is therefore necessary for the Secretary of State to be able to appoint the CAA or another person to carry out his or her functions.

The intention is to appoint the CAA to perform regulatory functions relating to:

- sub-orbital activities;
- spacecraft and high altitude balloons being operated for sub-orbital activities;
- carrier aircraft , as defined in clause 2(6), when being operated for the launch of sub-orbital spacecraft;
- carrier aircraft that are adapted to carry a rocket or other launch vehicle that can launch satellites into orbit (but not the regulatory oversight of the actual launch of the satellite into orbit);
- spacecraft that, for at least part of their trajectory, have some characteristics of a conventional aircraft[6], and are adapted to carry a rocket or other launch vehicle that can launch satellites into orbit (but not the regulatory oversight of the actual launch of the satellite into orbit);
- spaceports for sub-orbital activities; and

[6] Such spacecraft are sometimes referred to as "spaceplanes" even though we have chosen not to define this term in the Bill. They operate in part using aerodynamic lift (like an aircraft) and exo-atmospherically using a rocket engine or motor.

- range controllers and service providers for sub-orbital activities if a range control service were to be required for a sub-orbital activity.

CAA will also have concurrent regulatory functions with the UKSA for space activities that involve the use of a carrier aircraft.

Outline of the proposed content

It is proposed that the regulations will appoint the CAA to perform functions of the regulator in relation to sub-orbital activities, spacecraft used for sub-orbital activities, carrier aircraft, spaceports used for sub-orbital activities and range and range control services provided for sub-orbital activities.

It is intended these functions will be:

- granting exemptions from the requirement to hold a licence – clauses 4(2) and 7(4);
- granting a licence, inspection of sites and facilities etc and obtaining of information – clause 8;
- giving guidance in relation to safety requirements – clause 9(8);
- deciding what conditions to include in a licence – clause 12(1);
- deciding if a licence may be transferred, revoked, suspended or varied– clause 14;
- issuing guidance concerning compliance with requirements under safety regulations – clause 18(3);
- obtaining advice and assistance from qualifying health and safety authorities – clause 20(1);
- providing advice and assistance about the exercise of security regulation functions – clause 24(1) and (4);
- monitoring and enforcement and investigation and prosecution of offences – clause 25; and
- the giving of directions – clauses 26 and 27(1).

The following functions of the Secretary of State under the Bill will not be conferred on the CAA:

- any making of orders or regulations;
- confirming that exemptions to licensing do not affect public safety, health and safety of those taking part or international obligations;
- provision of the range control services under clause 6 – in the circumstances that this is provided by Secretary of State there is no scope for delegating it to CAA;
- issuing of security guidance under clause 22;
- authorisation of entry in emergencies under clause 32;
- indemnifications under clause 34; and
- maintaining a register of launches under clause 60.

The intention is that the CAA will also perform regulatory functions concurrently with the Secretary of State for:

- space activities where a carrier aircraft is used to carry a spacecraft for the purposes of a space activity;
- range;
- range control services; and

- spaceports established at a single location for the purposes of both space activities and sub-orbital activities.

These functions will effectively be the same as those the CAA currently perform under the Air Navigation Order 2016 in relation to civil aviation but performed in relation to sub-orbital spaceflight activities, spaceports and range control service providers.

The Government does not currently intend to prescribe a time limit for the exercise of these functions by the CAA as permitted for under clause 15(2(d).

Clause 16: Informed consent

Clause 16 prohibits an operator from letting an individual take part, in a prescribed role or capacity, in regulated activities unless the individual has signed a consent form agreeing to accept the risks, and fulfils prescribed criteria with respect to age and mental capacity.

Subsection (1) provides a power to make regulations:

- prescribing roles or capacities which are restricted to individuals who have given informed consent and who fulfil prescribed age and mental capacity criteria; and
- prescribing criteria with respect to age and mental capacity that an individual taking part in spaceflight activities in one of those roles or capacities must fulfil.

Subsection (3) provides a power to make regulations with provision:

- about the form and content of consent forms;
- about information to be given to individuals before they sign consent forms; and
- imposing evidential and procedural requirements with regard to the signification of consent.

Outline of the policy intent

The purpose of this power is to ensure the holder of an operator licence sets out in sufficient detail the risks associated with spaceflight activities and associated activities to individuals carrying out a prescribed role or capacity so that they can understand the risks to them associated with taking part in spaceflight activities which the licensee is licensed to carry out.

Outline of the proposed content

We anticipate that persons with prescribed roles or capacities set out in regulations will include:

- Payload customers of the spaceflight operator, in respect of damage suffered in respect of that payload;
- The pilot and crew on board a sub-orbital craft engaged in spaceflight;
- Spaceflight participants (those paying for a flight on board a sub-orbital craft, but not engaged in operating it);
- Any scientists or individuals engaging in experiments on a sub-orbital craft engaged in spaceflight;
- Other persons carried on board a sub-orbital craft engaged in spaceflight; and
- A small number of ground staff at the spaceport whose job is deemed as particularly high risk in nature (such a role will be prescribed in the regulations). We anticipate that range planning should mean that in practice the number of such persons will be very small as there is intended to be an exclusion zone around the launch. However, we cannot rule out, at this stage, the need for some persons to perform some tasks within an exclusion zone, or be required to undertake some other high risk duty.

The persons fulfilling roles and capacities prescribed under this clause will also be prescribed under clause 33(3) (excluding them from the right to bring a strict liability claim for damages) and clause

34(1)(b) (excluding them from the Secretary of State's powers to indemnify under that clause). The prescribed criteria with respect to age and mental capacity will include that:

- the individual must be at least 18 years old; and
- the individual must not lack mental capacity as defined in section 2(3) of the Mental Capacity Act 2005[7] and the holder of the operator licence must be satisfied that this is the case when it obtains the individual's informed consent.

The provision for the form and content of the consent form under subsection (3)(a) will prescribe a template, as yet to be finalised, but which will contain the name, address, gender and date of birth of the relevant individual, the name and address of the spacecraft operator, the date of the proposed spacecraft flight, the spaceport from which the spacecraft will launch, the spaceport at which the spacecraft will return to earth, the trajectory of the flight. The form will include a statement that the individual has received the prescribed information about, and confirms that they understand, the risks involved in the activity and that the individual voluntarily consents to those risks. In the case of ground crew, the form will refer to the nature of the tasks assigned to that individual. The form will be in the English language.

Information to be given to individuals before they sign consent forms under subsection (3)(b) will include:

- Relevant factual information and statistics, written in clear plain English, to state the safety record of relevant commercial spaceflight accidents and serious incidents. This must include the following:
    - The total number of persons who have been carried aboard sub-orbital human spaceflight commercial vehicles and the total number of deaths or serious injuries resulting;
    - The total number of launches and re-entries of sub-orbital human spaceflight commercial vehicles and the number of catastrophic failures of those launches and re-entries;
    - The safety record of the vehicle type the participant will be on board or will be working on, including the total number of launches and re-entries, the number of catastrophic failures of those launches and re-entries and whether the failures occurred during vehicle research and development or established commercial operations; and
    - Where catastrophic or serious incidents have occurred involving human spaceflight commercial vehicles have occurred, what corrective actions were taken.
- Statements that:
    - The activity may result in serious death or injury including total or partial loss of physical and mental function;
    - The regulator has not certified the spacecraft as safe to fly or be launched;
    - By taking part in a prescribed role or capacity, a person accepts that they will be unable to bring a strict liability claim against the operator in the case of injury or

[7] For the purposes of the Mental Capacity Act 2005, a person lacks capacity in relation to a matter if at the material time he is unable to make a decision for himself in relation to the matter because of an impairment of, or a disturbance in the functioning of, the mind or brain.

damage resulting from the spaceflight activity under clause 33(3) of the Bill (such individuals sustaining injury or damage as a result of spaceflight activities will still be able to bring a common law claim against the operator but would have to prove fault); and

- By taking part in a prescribed role or capacity, a person accepts that the power under clause 34 for the Secretary of State to indemnify an operator or claimant in situations where damage or injury is sustained will not apply to them.

An operator must inform a participant they may request additional information regarding commercial spaceflight accidents and human spaceflight incidents reported.

Before flight or, in the case of ground crew, before they begin work on a spacecraft, an operator must provide each participant with an opportunity to ask questions orally, to acquire a better understanding of the hazards and risks of the mission, and each participant must then provide consent in writing to participate in a launch or re-entry.

Evidential and procedural requirements with regard to signification of consent under subsection (3)(c):

- The consent form must be signed in duplicate and dated by the participant.
- The signatures must be attested by a witness who must be independent of the operator, at least 18 years old, who must also sign their attestation and include their full name and address and date of birth.
- One copy of the consent form must be provided to the operator and one must be retained by the participant.

Clause 17: Training, qualifications and medical fitness, including Schedule 2

Clause 17(1) provides that regulations, referred to as "training regulations", may provide for the training, qualifications and medical fitness of individuals who are either:

- taking part in, or otherwise engaged in connection with, spaceflight activities or the provision of range control services; or
- working at sites used for, or in connection with, spaceflight activities or the provision of range control services.

Schedule 2 contains examples of such provisions.

The regulations may specify roles and capacities that unqualified persons will not be allowed to carry out. The regulations may also specify criteria an individual must fulfil in order to be qualified.

Outline of the policy intent

The intention is to specify and enforce suitable standards of training, qualification and fitness to ensure that individuals taking part in spaceflight activities or provision of range control services or working at sites in connection with these are properly trained, qualified and fit to carry out their assigned tasks. The regulations will also specify roles or capacities and activities that an unqualified person may not carry out and criteria a person must meet in relation to training, qualifications and medical fitness.

Outline of the proposed content

General

It is proposed that the regulations will set out requirements for the training, qualifications and medical fitness of individuals taking part in spaceflight activities, such as flight crew, ground crew and passengers on board the spacecraft, and providers of range control services. Training providers of such individuals will have to be approved by the regulator. Regulations will include, but not be limited to, the matters described in Schedule 2.

Training and qualifications of crew on board a spacecraft

Roles with safety critical functions in relation to the operation of spacecraft (both on board spacecraft and on the ground) require persons of prescribed competency, currency in active duties and experience (i.e. recently qualified persons with limited relevant experience or who have not recently performed such duties will not be allowed to operate spacecraft or carry out operations on the ground). So far as spacecraft operations are concerned, these functions are to be primarily discharged by the flight crew, namely one or more pilots but potentially including other safety critical roles. Further work to identify such other roles is to be carried out by the CAA and UK Space Agency.

Discussions with industry and spaceflight regulators in other countries has led to the conclusion that the regulations should require that flight crew:

- Come from a military fast jet or fixed wing test pilot background or can demonstrate an equivalent level of experience;
- Hold a commercial pilot's licence with an instrument rating;
- Have completed suitable training in aerobatic flight , including sustained high 'G' manoeuvres (i.e. manoeuvres that impose high acceleration and therefore gravity forces on an individual and where appropriate unpowered flight when the craft is not flying under its own power but is gliding instead, typically when it is returning to earth to land);
- Have completed an appropriate syllabus of training for the specific spacecraft to be flown, using appropriate synthetic training devices and achieved a satisfactory assessment, approved by the regulator;
- Must provide additional demonstration of competence upon expiry of time bound privileges granted by successful completion of the training assessment; and
- Hold a current flight crew medical certificate issued by a qualified aeromedical medical examiner certified by the aviation authority of the state of (pilot) licence issue.

Regulations will also require that individuals carrying out safety critical roles (other than flight crew) on board a spacecraft (such as any cabin crew):

- Have completed suitable training for their role. (At this stage it is not possible to say what suitable training would be and this will be established as part of the work in developing the regulations.);
- Have completed suitable high 'G' training in an aerobatic aircraft or centrifuge; and
- Hold a medical certificate (see footnote 3).

Training and qualifications of participants

Regulations will require that spaceflight participants on board a spacecraft other than the crew:

- Complete training on the operation of on–board safety equipment and emergency response drills; and
- Undertake to the satisfaction of the training supervisor pre-flight experience or familiarisation of the rigours of space flight.

Training and qualifications of other spaceflight personnel

Regulations will provide that other individuals taking part in spaceflight activity (such as ground crew) will require training commensurate with the type of activity they are involved in, namely training essential to carry out their roles to a satisfactory standard, ensuring the safety of themselves and others.

Training and qualifications of personnel responsible for unmanned spaceflight activities

Regulations will provide that other individuals in spaceflight activity involving unmanned missions, such as launch vehicle controllers and range control service personnel, will require training commensurate with the type of activity they are involved in, namely training essential to carry out their roles to a satisfactory standard, ensuring the safety of themselves and others.

Training and qualifications of launch vehicle operations personnel

Regulations will provide that individuals undertaking prescribed roles for the provision of launch vehicle operations services will require training, qualifications and, for some roles, medical fitness commensurate to the activities they are undertaking. These roles will include:

- Launch decision authority;
- Launch director;
- Flight controllers; and
- Fuellers.

Training and qualifications of range control service personnel

Regulations will provide that individuals undertaking prescribed roles for the provision of range control services will require training, qualifications and, for some roles, medical fitness commensurate to the activities they are undertaking. These roles will include:

- Range controller
- Range safety officer
- Range monitoring officer
- Spacecraft tracking officer
- Instrumentation coordinator
- Communications officer
- Disaster control officials
- Countdown controllers

Regulations will provide that individuals holding other safety-critical roles in the provision of range control services may also require training and qualifications commensurate with the type of activity they are involved in, namely training essential to carry out their roles to a satisfactory standard, ensuring the safety of themselves and others.

Training regulations in respect of training providers

Regulations will require that:

- Training providers must be approved by the regulator;
- Content of any training course must be approved by the regulator;
- Training devices must be approved by the regulator;
- Vehicles or craft used for training must be approved by the regulator;
- Regulator may inspect approved training organisations and training devices; and
- All documents and training records must be kept for a period of time and are made available for inspection by the regulator on request.

Training regulations in respect of operators

Regulations will require that the operator is responsible for:

- Publishing appropriate training manuals;
- Ensuring that evidence of competency, experience and currency in a prescribed role is demonstrated and tracked by the organisation and up to date records kept; and

- Ensuring that any participant is fit to fly and that the overall strategy for the management and mitigation of the medical risks is embedded within the operator's management system.

Medical fitness

The requirements relating to levels of medical fitness and medical scrutiny of individuals taking part in spaceflight activity will vary depending upon their role.

It is intended that flight crew will hold an International Civil Aviation Organisation (ICAO) Class 1 medical certificate or equivalent issued by a medical examiner certified by a competent authority, such as the CAA, the Federal Aviation Administration (FAA) or similar authority.

Further medical requirements will be developed to ensure that all spaceplane flight crew can tolerate, and not be harmed by, the environmental hazards and physiological stressors likely to be encountered. These further requirements will then be used for the issue of a medical certificate for sub-orbital spaceflight operations. It is considered reasonable for these requirements to be developed further in the light of the experience of initial commercial spaceplane operations.

It is intended that other crew (i.e. other than the flight crew) will hold a medical certificate appropriate for their role.

It is not intended to directly regulate for the medical fitness of participants (i.e. individuals such as scientists and passengers on board the spacecraft but not part of crew). It will be up to the operator to be satisfied that participants are 'fit to fly' and this will be done under the operator's safety management system. It is anticipated that guidance material will be developed to assist operators.

Ancillary provisions

It is proposed that the regulations will contain ancillary provision for:

- Inspection of crew licences and medical records and operator training records; and
- Revocation, variation or suspension of authorisations or approvals and medical certificates.

Clause 18: Safety regulations, including Schedule 3

Clause 18 provides that regulations may be made:

- to secure the safe operation of spaceports and mission management facilities;
- to secure the safe conduct of spaceflight activities;
- to secure that the range for spaceflight activities enables the activities to be carried out safely.

Outline of the policy intent

This clause provides the power to make safety regulations to support safe spaceflight activities and safe operation of spaceports and mission management facilities. The safety regulations would place controls on how spaceflight activities and spaceport and mission management facilities operations are conducted.

Safety is addressed throughout the Bill, with detailed requirements under the regulations relating to specific activities and licensing. The regulations made under clause 18 will provide for overarching safety regulations and those not captured elsewhere.

Outline of the proposed content

Schedule 3 gives illustrative examples of particular kinds of provision that may be made by safety regulations. Not all safety regulations will be applicable to every kind of activity. Some safety provisions will be included in the licence conditions (e.g. site specific safety conditions). However, by providing for some safety matters and requirements in regulations there will be greater Parliamentary oversight and additional legal certainty, which will assist businesses that are contemplating spaceport or spaceflight activities in the UK.

We intend to have draft outlines available in Autumn 2017 to support ongoing development and consultation with industry.

In relation to spaceports, regulations will prescribe:

- Who may have access to the spaceport and the terms of such access;
- How the storage and handling of fuels and propellants will be managed;
- How adequate separation distances between fuel facilities, vehicles and the general public will be determined;
- What operations manuals and safety management systems must be maintained by the spaceport operator; and
- What qualifications, if any, that are required by the individuals involved with space activities at spaceports, and the period of validity for such qualifications.

Such requirements will supplement the matters prescribed under clause 9, which is concerned with matters that must be in place prior to the grant of a licence, whereas the broader powers in clause 18 will ensure continuing oversight.

In relation to spaceflight activities, regulators will take into account, when considering an application from operators who wish to conduct spaceflight operations in the UK, a number of elements, including, but limited to the following:

- On the suitability of the spaceport location in respect its geographical location, its proximity to populated areas and conditions (e.g. atmospheric) are suitable to undertake spaceflight activities.
- The risk assessment process carried out as required by clause 9 (2) on craft identified in clause 1 to enable the issue of a licence as set out in clause 9 to carry out spaceflight activities from a given location.
- How such craft are to be maintained.
- Matters relating to the serviceability of the craft.
- That the craft is operated in accordance with the applicable manufacturer's limitations.
- Operational limitations in certain meteorological conditions.
- The minimum equipment, navigation, communication and safety equipment requirements to enable specific activities.
- Matters relating to the serviceability of such equipment.
- Restrictions related to payloads placed within a spacecraft, including:
    - prohibiting transport of certain items (e.g. weapons);
    - requiring additional licence and oversight (e.g. hazardous chemicals as part of research experiments); and
    - limitations on the number of satellites, participants, etc.
- Preparation and planning conditions operators and crew must take before activities commence.
- How prescribed persons (e.g. persons performing roles or acting in capacities prescribed under Schedule 3 paragraph 4(1)) are to carry out their duties.
- Examples of qualifications (or equivalent demonstrable experience) such prescribed persons must hold and the period of validity for such qualifications.
- The responsibilities of the person in charge of the craft.
- Ensure that employees (e.g spaceport, operator, etc) have adequate procedures to deal with the management of fatigue for persons involved in spaceflight activities.
- The principles under which the regulator may order operations to cease, both temporarily and permanently.
- Prohibitions and restrictions on carriage of certain dangerous goods and payloads.
- The application of sections 92 to 94 of the Railways and Transport Act 2003 (which provide for the performance of certain functions under the influence of alcohol or drugs to be an offence).
- Areas of airspace that the activities may not be conducted in.
- Flying and navigation rules, including appropriate weather conditions.
- What operations manuals must be maintained by the operator.
- What safety management systems must be maintained by the operator.

So far as range is concerned, range-specific safety requirements may be prescribed under clauses 5, 6 and 7 as described in the notes for those clauses. However, those powers are primarily directed at the range control service provider.

The powers in clause 18 are not specific to any person and are therefore necessary to provide for the safe operation of a range or of range control services more broadly. For instance, paragraph 1(4) of Schedule 3 enables regulations to be made in relation to apparatus used in connection with the navigation of spacecraft or carrier aircraft. Such regulations, might for instance:

- require such apparatus to be subject to various safety or security checks during manufacture or transport;
- prohibit any person from interfering with such apparatus;
- require the range control service provider to demonstrate the operation of its range apparatus to the regulator; or
- require the range tracking system to meet particular performance standards.

The list of examples provided above is not exhaustive and further evidence and consultation will take place to refine these requirements, based on stakeholder feedback and international best practice.

Clause 19: Investigation of accidents

Clause 19(1) provides a power to make regulations that provide for the investigation of accidents (whether occurring in the UK or elsewhere) arising out of or in the course of spaceflight activities (including activities to which the Outer Space Act 1986 applies).

Clause 19(2)(a) provides a power to make regulations corresponding to those made under section 75(3) of the Civil Aviation Act 1982.

Clause 19 (2)(b) provides a power to make provision for the recovery of expenses incurred by a person investigating an accident, from other prescribed persons.

Outline of the policy intent

The purpose of this clause is to grant the Secretary of State the power to make regulations to enable the investigation of accidents that involve spaceflight activities and to recover expenses incurred in, or in connection with, an investigation. There are no UK or international regulations or UN space treaties regulating accidents in space.

The Secretary of State already has the power to investigate any accident arising out of or in the course of air navigation and either occurring in or over the UK or occurring elsewhere to aircraft registered in the UK and for carrying out any annex to the Convention on International Civil Aviation 1944 ("the Chicago Convention") under section 75(1) of the Civil Aviation Act 1982. The Secretary of State exercises his existing powers to investigate air accidents and incidents pursuant to Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation and repealing Directive 94/56/EC and the Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 1996 (1996/2798) ("the 1996 Regulations").

The Government's intention is to provide, by regulations, arrangements for the investigation of accidents involving spaceflight activities. Such regulations will take into consideration developments in international space law and adopt, so far as appropriate, the existing investigation regime of the 1996 Regulations and broadening it as necessary as space law develops.

Outline of the proposed content

It is intended that regulations made under subsection (1) will make provision that corresponds to that made in the 1996 Regulations, subject to any necessary modifications to avoid inappropriate referencing or inoperability. Modifications will be necessary because the 1996 Regulations, inter alia, implement annex 13 of the Chicago Convention and Regulation (EU) No 996/2010 of the European Parliament and of the Council on the investigation and prevention of accidents and incidents in civil aviation. Both of these instruments only apply to aircraft accidents.

Significant matters addressed in the 1996 Regulations are as follows:

- The Air Accident Investigation Branch (AAIB) to be appointed the investigation authority;

- The purpose of an investigation is to prevent accidents and incidents and shall not apportion blame or liability;
- The powers of investigating inspectors;
- The form and content of investigations;
- The form and content of a report following an investigation; and
- Safety recommendations.

It is proposed that regulations made under subsection (2)(a) will make provision corresponding with the following matters, contained in section 75(3) of the Civil Aviation Act 1982:

- Prescribed persons to be required to give notice of any relevant accident.
- Applying any provisions of section 3 of the Notice of Accidents Act 1894.
- Controlling access to and permitting examination etc of a craft that has been involved in an accident.
- Authorising or requiring the cancellation, suspension, endorsement or surrender of a licence issued under this Bill (or referred to in section 75(3)(d) of the Civil Aviation Act 1982 , if relevant).

It is proposed that regulations made under subsection (2)(b) will provide for:

- The AAIB to recover expenses incurred in or in connection with an investigation from prescribed persons; and
- The prescribed persons from whom expenses can be recovered.

Clause 20: Assistance etc with performance of regulator's safety functions

Clause 20(2)(c) provides that regulations may prescribe a body or person whose functions are of a public nature relating to safety to be a qualifying health and safety authority for the purposes of clause 20.

Clause 20(6) provides that regulations may prescribe functions which a regulator may not authorise a qualifying health and safety authority to carry out.

Outline of the policy intent

The purpose of this clause is to enable the regulator to request advice and assistance from a qualifying health and safety authority in connection with any of the regulator's function relating to safety ("the safety functions"). It also enables the regulator to authorise qualifying health and safety authorities to carry out such safety functions as are specified on its behalf (as currently exists in civil aviation). The power to seek advice from or authorise health and safety authorities to perform safety functions on its behalf, will provide the regulator with the ability to best manage and regulate the risks of spaceflight activities.

Subsection (2) lists the Health and Safety Executive (HSE) and the Office for Nuclear Regulations (ONR) as qualifying health and safety authorities. This list can be added to by regulations to enable future bodies to be added as necessary.

Subsection (6) enables the Secretary of State to make regulations to restrict the functions that health and safety authorities may perform on behalf of the regulator.

The policy intent is to ensure that in carrying out its functions (e.g. the licensing functions), the regulator is able to draw on the expertise of the HSE, the ONR or another prescribed body or person (as appropriate) to inform its decision making and can require such advice and assistance to be provided to any other person in connection with the safety functions.

Regulators need the flexibility to authorise health and safety authorities to perform regulatory functions on their behalf in cases where that health and safety authority has the greatest specialist expertise. For instance, there are existing competent authorities with expertise and responsibility for regulating control of major accident hazards involving dangerous substances under the Control of Major Accident Hazard Regulations 2015 (SI 2015/483). However, it is important that the Secretary of State has the power to control delegation of certain functions in cases where this is not considered appropriate.

Outline of the proposed content

We do not have any plans at present to prescribe any additional bodies. This is a future proofing provision that will enable the inclusion of any new health and safety authority which may be established in the future.

We do not, at this point, intend to restrict the functions that health and safety authorities may perform on behalf of a regulator.

Clause 22: Security regulations, including Schedule 5

Clause 22(1) provides a power to make regulations to ensure security in relation to the matters listed in that subsection. Schedule 5 provides a non-exhaustive list of provisions that may be included in such security regulations.

Outline of the policy intent

The policy intent behind clause 22 is to give the Secretary of State the power to establish, through regulations, minimum security standards to prevent acts of unlawful interference with spacecraft and spaceflight activities.

For aviation, the UK's National Aviation Security Programme (NASP) is based around EU common baseline standards of civil aviation security, primarily Regulation (EC) 300/2008 and Implementing Regulation 2015/1998, supplemented by directions given by the Secretary of State, under powers in Part II of the Aviation Security Act 1982 ("the 1982 Act").

It is envisaged that the security provisions for spaceflight will be similar to that applicable to civil aviation, except in respects where there is a material difference in technologies or risk assessments that justifies a different approach. For instance, much of the current aviation security regime is based on the prevention of prohibited articles from getting onto an aircraft that may then be used to either damage or destroy the aircraft itself or facilitate unlawful interference with its operation. As there will be no manned vertical launch operations for the foreseeable future, some of these aviation security measures will not be relevant to vertical launch spaceports (for example, those concerning the screening of passengers and crew). Also, for vertical launch spaceports, there may be specific reasons why certain current aviation rules are inapplicable and would need to be dis-applied, with alternative security measures, agreed with the regulator as providing an acceptable level of security protection, applied instead. For instance, airport screening equipment and sniffer dogs could contaminate sensitive payloads like satellites and this may require enhanced rules around the assembly, transport and safeguarding of such payload instead.

Outline of the proposed content

The proposed content of the regulations to be made under this provision is illustrated by the examples set out in Schedule 5.

<u>Paragraphs 1(1) & 1(2) of Schedule 5</u>

It is proposed to make security regulations in respect of spaceflight activities and associated sites and facilities covering:

- The protection of, and control of access to, sites and facilities in scope of subsection (1)(c) of clause 22 ("space sites") or parts of space sites, in similar terms to sections 1.0, 1.1, 1.2 (excluding 1.2.4 1.5) and 1.6 of Annex 1 to Regulation 2015/1998, so far as they are appropriate or necessary to spaceflight activities;
- The protection of spacecraft and carrier aircraft, in terms similar to section 3 of Annex 1 to Regulation 2015/1998;

- The security vetting of persons recruited to implement, or be responsible for the implementation of screening, access control or other security controls at a spaceport, in similar terms to section 11.1 of Annex 1 to Regulation 2015/1998;
- The screening of persons seeking to enter areas of space sites, in similar terms to section 1.3 (staff and crew) and section 4 (passengers and cabin baggage) of Annex 1 to Regulation 2015/1998;
- The control of vehicular access to space sites or prescribed areas of space sites; and
- The screening of vehicles, payloads, cargo, supplies and other things for the purposes of determining whether they may be allowed access to a space site or a part of a space site to which access is restricted, in similar terms to sections 1.4 (vehicles), 5 and 6 (cargo or payloads) and 9 (airport supplies) of Annex 1 to Regulation 2015/1998 so far as the same are appropriate to the nature of spaceflight operations.

Paragraph 1(3) of Schedule 5

The regulations will provide the regulator with a power to prevent rights of way being exercised within a space site for limited periods (for example, during the preparation for and launch of, an orbital or sub-orbital spaceplane, at the request of the space site operator).

Paragraph 1(4) of Schedule 5

The regulations will provide for the training and qualifications of persons responsible for implementing security measures at a space site, or the training of those responsible for implementing security measures more generally. Such provisions will be in similar terms to sections 11.0, 11.2, 11.3 and 11.4 of Annex 1 to Regulation 2015/1998 modified as necessary to reflect the nature of spaceflight operations.

Paragraph 1(5) of Schedule 5

The regulations will make provision for security requirements governing the use and security of flight termination systems. This is a matter for which there is not an existing precedent in aviation security legislation. Elements of such systems could be a prohibited article under civil aviation security requirements if carried on board an aircraft and a specific exemption from the prohibition of such articles forming part of a flight termination system on spaceplanes may be required. Such systems may be necessary in the case of an unmanned spacecraft or space object to mitigate a safety risk to persons or objects on the ground. Regulations will include requirements for the electronic security of such systems, to prevent remote interference, and to reflect that flight termination systems will vary in technical character, depending on the type of spacecraft and operation (or example, the degree to which there is a 'human in the loop' versus autonomy of systems or the method of termination).

Regulations will be outcome-driven and operators will be required to demonstrate that any flight termination system:

- is secure from electronic interference (e.g. where direct control is required, communication links are secure); and
- is secure from physical interference (e.g. is stored in restricted areas in the spaceport prior to launch).

Regulations will also require that any system:

- is capable of terminating a flight which deviates from its nominal trajectory beyond agreed tolerances;
- meets reliability standards; and
- does not increase risk. So, for example:
    - for an explosive system, debris scatter modelling will be performed in advance to identify parts of the flight trajectory on which destruction would unacceptably increase risk; and
    - for a thrust termination system, trajectory modelling will be performed in advance to identify parts of the trajectory on which the uncontrolled onward flight of the spacecraft would unacceptably increase risk.

Paragraph 2 of Schedule 5

So far as it is appropriate to the nature of spaceflight operations, regulations will extend additional existing domestic aviation legislation to space sites, spaceflight activities, spacecraft and carrier aircraft, either directly or in a modified form, as follows:

- Part 2 of the 1982 Act (concerning the protection of aircraft, aerodromes and air navigation installations against acts of violence) excluding certain sections that are not relevant to spaceflight activities. Due to fundamental differences in the operations to be carried out from horizontal and vertical spaceports, some provisions will differ in their applicability. Horizontal operations are expected to include crew and, in some circumstances, passengers, and are thus akin to conventional aviation, whereas vertical operations will be unmanned so some provisions will apply differently or not at all. For example:
    - Clause 11A of the 1982 Act which deals with the designation of security restricted areas: different classes of restricted areas may be required for vertical launch sites, since flight termination systems may be permitted (see comments on paragraph 1(5) of Schedule 5 above).
    - Clauses 13 and 13A which deal with the power to promote searches: this will be applied differently in vertical spaceports, for example where there are sensitive payloads which may be damaged by conventional screening and thus will be required to be screened off-site. Furthermore, whilst all spaceports are likely to require screening requirements for staff, contractors and others entering sensitive areas (as they do at airports), screening requirements for crew and passengers on vertical operations will not be necessary – because vertical operations will be unmanned.
    - Clause 21A which concerns false statements relating to baggage, cargo etc. will not be relevant for vertical launch sites, since vertical operations will not carry baggage or cargo.
    - Clause 21D which concerns unauthorised presence of a person on board an aircraft will not be relevant for vertical operations since there will be no people on board. (In the event that a person did gain physical access to an unmanned spacecraft, that

person would be committing an offence under Schedule 4 paragraph 3, and most likely under paragraph 2 as well.)

- Part 2A of the 1982 Act (security planning for aerodromes),
- Part 3 of the 1982 Act (the policing of aerodromes) with the exception of section 28 (regarding bylaws at aerodromes).

Paragraph 3 of Schedule 5

So far as it is appropriate to the nature of spaceflight operations, regulations will correspond to the following provisions in domestic aviation legislation:

- Section 21F of the 1982 Act (in respect of air cargo agents), including the consultation provisions;
- Section 21G of the 1982 Act (in respect of the duty to report certain occurrences relating to aviation security), including the consultation provisions; and
- Section 94 of the Transport Act 2000 (relating to orders for the possession of aerodromes), including the provisions relating to compensation.

Clause 23: Spaceport byelaws

Clause 23(1) provides a power for a spaceport licensee to make byelaws regulating the use and operation of the spaceport and the conduct of persons within it to ensure security of the spaceport, spaceflight activities and associated activities and spacecraft and payloads.

Clause 23(10) provides a power for the Secretary of State to make regulations revoking or varying a spaceport byelaw after consulting the person who made the byelaw.

Outline of the policy intent

The purpose of clause 23(1) is to allow a spaceport operator to make local byelaws to protect the safety and security of operations at the spaceport and the security of spacecraft, vehicles and persons using the spaceport. This is similar to existing powers given to airport operators under section 63 of the Airports Act 1986. The spaceport operator may make byelaws to regulate vehicular traffic within the spaceport, prohibit or restrict access to any part of the spaceport, preserve order within the spaceport and prevent damage to property in the spaceport.

It may be that this power will be exercised in respect of every spaceport, or only at some. Likewise, some spaceports, co-located with an existing aerodrome, may already be subject to an airport byelaw regime (i.e. there will be concurrent powers to make byelaws). The power to make regulations under this clause provides the necessary flexibility to ensure that byelaws can be made where necessary. These byelaws take effect on confirmation by the Secretary of State.

Clause 23(10) enables the Secretary of State to make regulations revoking or varying a spaceport byelaw following consultation with the maker of the byelaw. This is a reserve power and the Government intends to exercise this power only as necessary to the extent that byelaws are inconsistent with safety, security of the spaceport, national security or any international obligations of the UK.

Outline of the proposed content

The regulations under clause 23(1) prescribing spaceports at which security byelaws may be made will be broadly similar to the designation orders made under section 63 of the Airports Act 1986. Such instruments are extremely brief: they merely reference the power in the primary legislation and provide a schedule of designated locations in respect of which the power is exercised.

For an example, see The Airport Byelaws (Designation) Order 1987 – SI 1987/380:

http://www.legislation.gov.uk/uksi/1987/380/made

An example of an airport byelaw can be found at:

http://www.heathrow.com/file_source/Heathrow/Static/PDF/HAL_Byelaws_2014.pdf

Not every location will require such extensive byelaws as those required at Heathrow and the measures implemented will reflect local circumstances.

Clause 25: Monitoring and enforcement by regulator

Clause 25 makes provision for monitoring and enforcement by requiring the regulator to monitor spaceflight activities, operation of spaceports, provision of range control services by range controllers and associated activities ("regulated activities") for certain purposes. Those purposes are specified in subsection (2).

There is power under subsection (3) to make regulations for the purposes set out in subsection (2). The kinds of provisions that may be included in the regulations are set out in clause 25(3)(a) to (g).

Outline of the policy intent

The policy intent of the clause is to require, and enable, the regulator to monitor regulated activities and to ensure they are duly and safely conducted in relation to such matters as compliance with the provisions of the Bill and of regulations made under it, with licence conditions and with the international obligations, public safety and national security of the UK.

It is an important principle of regulation that a regulator should have the necessary powers to conduct proper oversight of regulated entities, in order to ensure they comply with their statutory duties and obligations and with any conditions applying through their licence. In addition, because of its international obligations and for reasons of national security, the regulator should also have powers set out in regulations to conduct oversight of regulated activities. It is proposed that these powers are provided in the regulations.

Outline of the proposed content

It is proposed that the regulations will make detailed provision for the following matters, in relation to powers for the regulator and inspectors appointed by the regulator:

- To require information to be supplied to the regulator by any person carrying out regulated activities.
- Inspection of equipment, sites, facilities, spacecraft, carrier aircraft and other vehicles used by or for persons carrying out regulated activities, as well as payloads.
- The production and inspection of, and to require persons to preserve for specified periods, specified documents and records from persons involved in regulated activities. These may include:
    - flight and ground crew licences;
    - risk assessments and reviews;
    - operations manuals;
    - operating procedures;
    - maintenance records;
    - flight and launch records;
    - recordings by cockpit voice and flight data;
    - records including records of personnel, security screening carried out by spaceport operators, vehicular access to spaceports and prescribed areas of spaceports, cargo,

payloads, supplies and things carried on a spacecraft, of crew and participants, fuel records;
    - consents provided by individuals taking part in regulated activities; and
    - insurance documents required to be provided.
- To retain documents and records to enable inspectors to examine them and to take copies of them.
- The appointment of inspectors by the regulator, their powers and duties. These may include:
    - rights of access to places where regulated activities are being carried out, in order to carry out inspections;
    - powers to breathalyse persons carried out certain prescribed roles (e.g. crew of spacecraft) and perform drug tests on them;
    - inspection and copying of documents and records;
    - the giving of directions under clauses 26 and 27(1);
    - the detention of spacecraft;
    - inspection of payloads carried by spacecraft;
    - the basis on which information will be shared with other public authorities and international organisations that regulate any aspect of spaceflight activities powers.
    - restrictions on disclosure of information obtained from a person carrying out a regulated activity and permitted exceptions to this (e.g. with other public authorities and international organisations as set out above) for crime prevention or detection purposes, national security, etc.
    - power to detain spacecraft and to direct that the craft may not be flown in specified circumstances, e.g. where it appears to the regulator that the craft is not fit to fly or equipment is not serviceable or where the craft does not meet minimum equipment requirements, and powers to take such steps as are necessary to detain the craft, including for this purpose entering a spaceport and inspecting the craft.

These provisions are drawn to a large extent from powers available to the Civil Aviation Authority (CAA) and to persons authorised by it which are set out in Part 9 and Chapter 4 of Part 10 of the Air Navigation Order 2016.

Clause 33: Liability of operator for injury or damage etc

Clause 33(3)(a) contains a power to make regulations prescribing a description of individuals taking part in, or otherwise engaged in connection with, spaceflight activities to whom the strict liability of the operator in respect of injury and damage to such individuals does not apply.

Clause 33(5) contains a power to make regulations to limit the amount of liability of the holder of an operator licence (whether for a strict liability claim under clause 33(1) or more generally). The exercise of this power may be limited to prescribed circumstances or in the case of prescribed persons.

Outline of the policy intent

Clause 33(2) creates a strict liability cause of action for surface damage in the UK, UK territorial waters or to aircraft in flight, where such damage is caused by spaceflight. The purpose is to ensure that the uninvolved general public will have a straightforward remedy for compensation should they sustain any injury or damage as a result of spaceflight activities, without the need for complex litigation. The delegated power in subsection (3)(a) is intended to ensure that persons who are voluntarily involved in spaceflight activities, in full knowledge of the inherent risks (whether contractual, financial or physical risks), do not benefit from this strict liability right.

The power in subsection (5) serves a different purpose, which is to limit the liability of the operator, particularly as the market and technologies develop. This is because evidence from industry and other states demonstrates that obtaining insurance cover, above a certain amount, may be difficult to obtain at a reasonable cost or at all. Managing an unlimited largely uninsured liability will deter investment and innovation. Furthermore, all the other main space launch states – including the United States of America, France and Australia – similarly cap operator liability.

The intention would be only to exercise the power to the minimum extent necessary to address market failure in terms of the availability of affordable insurance. A delegated power gives greater flexibility than a cap in primary legislation because we can respond to changes in the market.

Outline of the proposed content

The power in subsection (3) provides that regulations may prescribe that there is no operator strict liability, in respect of injury and damage caused to prescribed persons taking part in, or otherwise engaged in, spaceflight activity. This class of person will be those individuals of full capacity who voluntarily engage in the spaceflight activities, who do so in full knowledge of the risks and who sign an informed consent (as required by clause 16(1)) to indicate they understand the risks involved.

We anticipate that persons who will be prescribed in regulations as excluded from the right to bring a strict liability claim will be as follows:

- Payload customers of the spaceflight operator, in respect of damage suffered in respect of that payload;
- The pilot and crew on board a sub-orbital craft engaged in spaceflight;

- Spaceflight participants (those paying for a flight on board a sub-orbital craft, but not engaged in operating it);
- Any scientists or individuals engaging in experiments on a sub-orbital craft engaged in spaceflight;
- Other persons carried on board a sub-orbital craft engaged in spaceflight; and
- A small number of ground staff at the spaceport whose job is deemed as particularly high risk in nature (such a role will be prescribed in the regulations). We anticipate that range planning should mean that in practice the number of such persons will be very small as there is intended to be an exclusion zone around the launch. However, we cannot rule out at this stage the need for some persons to perform some tasks within an exclusion zone or be required to undertake some other high risk duty.

Such individuals sustaining injury or damage as a result of spaceflight activities will still be able to bring a common law claim against the operator but would have to prove fault.

In addition, it is intended to prescribe that the strict liability of the operator will not apply to those persons required to enter into waivers or indemnities with the operator pursuant to a licence condition as envisaged in paragraph 35 of Schedule 1. All such persons will be required to bear their own losses and may contractually allocate risk between themselves or bring fault based claims.

The provision in subsection (5) provides that there is a power to make regulations to limit the amount of third party liability of the holder of an operator licence in respect of any claim for injury or damage that arises out of spaceflight activities.

If a third party liability cap were to be placed on spaceflight activities carried out from the UK, the regulations would set out how such a cap should be calculated. In the US, the 'limit of liability' or amount of insurance that a satellite operator must evidence in order to be given a launch licence by the Federal Aviation Authority (FAA) depends on a maximum probable loss (MPL) assessment: "The MPL is a dollar value assessment of government and third party properties at risk of damage from launch-related activities or conduct."[8]

There will be consultation concerning the methodology to be established in secondary legislation for the purpose of determining any third party liability cap. As subsection (6) of clause 33 makes clear, actual third party liability caps for individual activities or operations may be expressed as individual licence conditions, which may vary.

One option that will be considered in the consultation will be to base any UK methodology on a similar calculation of MPL as is used within the US legislation. If a similar methodology is adopted in the United Kingdom, the regulator will apply the rules in secondary legislation to assess the risks in each mission and, if appropriate, a third party liability cap will be set on the level of risk and on a case by case basis. Further work will need to be undertaken before considering whether and how this power should be exercised.

[8] https://www.faa.gov/about/office_org/headquarters_offices/ast/launch_license/mpl_values/

Subsection (5)(b) provides a further power to constrain the use of the cap to prescribed circumstances or in the case of persons of prescribed descriptions. For instance, we envisage that the cap would not apply in the case of operator wilful misconduct.

Any regulations made under the power in clause 33(5) will not affect either section 65 of the Consumer Rights Act 2015 or sections 2 and 3 of the Unfair Contract Terms Act 1977.

Clause 34: Power of the Secretary of State to indemnify

Clause 34 provides for the following powers to make delegated legislation in respect of the Secretary of State's ability to indemnify persons who have sustained injury or damage as a result of spaceflight activities in which they were otherwise not involved:

- Subsection (1)(b) provides a power to make regulations prescribing the description of individuals taking part or otherwise engaging in spaceflight activities to whom subsections (2) and (3) of this clause do not apply. In other words, regulations that would restrict the power of Secretary of State to make payments to meet liabilities in respect of certain classes of person who are voluntarily involved in spaceflight activities.
- Subsections (5)(a)-(b) and (6) provide a power to make regulations prescribing the limits on the amounts the Secretary of State may pay under subsections (2) and (3) and to prescribe circumstances where the power does not arise.

Outline of the policy intent

The powers in this clause all constrain the discretion of the Secretary of State to make payments to cover the operator's liability. That discretion is also subject to the parameters set by subsections (2) and (3). Any restrictions would support the overall policy intent which is to ensure that:

- Where subsections (2) and (3) permit the Secretary of State to indemnify, the intention is that this should be to the minimum extent that is necessary to:
    - to meet Government's international obligations;
    - allow the development of spaceflight and associated insurance products; and
    - ensure that members of the public are compensated for any loss they sustain.
- The power is not to be exercised to relieve insurers, or other culpable third parties, of their obligations nor to compensate individuals for risk they have voluntarily undertaken;
- The power is not to be exercised to relieve other states of their obligation or if there is a risk of double payment (when such states are jointly liable under the UN Liability Convention). However, since the intention of the power to indemnify, is inter alia, to avoid hardship for members of the public who suffer loss, regulations may permit the Secretary of State to make payments pending agreement with other States on attribution of liability and potentially subject to conditions;
- The Government does not indemnify the operator for any wilful misconduct.

The precise form of the restrictions to be imposed will be consulted upon so that we strike the correct balance between providing the necessary environment to allow the UK market to develop, whilst ensuring any Government exposure is limited to the minimum extent necessary.

Any restrictions imposed by regulations are not intended to constrain the prerogative power of the Secretary of State to make payments pursuant to any treaty obligations of the UK (in particular under the UN Liability Convention).

Outline of the proposed content

Clause 34(1) provides that the Secretary of State may indemnify an operator or a claimant in certain situations where personal injury, death or physical damage[9] is sustained by a person as a result of spaceflight activities carried out by the holder of an operator licence and the operator is liable to that person or another person in respect of that loss or damage. This indemnity would not apply in purely financial circumstances that are unrelated to physical damage or injury.

This indemnity from the Secretary of State to an operator or claimant does not apply to loss or damage suffered by an individual of a prescribed description taking part in, or otherwise engaged in the space flight activities. These individuals are likely to include at least the same classes of person as are excluded from the right to bring a strict liability claim against the operator by virtue of clause 33(3) or regulations made under subsection (3)(a) of that clause. These persons will be:

- Persons who caused or contributed to the injury or damage by their own negligence (clause 33(3)(b);
- The same class of persons prescribed under clause 33(3)(a); and
- The same class of persons required to enter into waivers and indemnities with the operator pursuant to licence conditions as described in paragraph 35 of Schedule 1.

The situations where the Secretary of State may indemnify an operator or a claimant are set out in subsections (2) and (3).

Subsection (5)(a) provides a power to make regulations setting an upper limit (or different upper limits applicable to different circumstances) on the amount of money the Secretary of State may pay out under those provisions. For example, US spaceflight legislation limits the government financial guarantee for launch activities to $3.1 billion in 2017[10]. Further work will need to be undertaken on whether the regulations will set out an upper limit of the Government's indemnity for certain activities and, if so, what this might be.

Subsection (5)(b) provides a power to prescribe cases or circumstances where the Secretary of State's power to indemnify either an operator or a claimant does not arise, or is restricted. Examples of situations that may be included in such regulations are:

- Where the damage is a result of wilful misconduct on the part of the operator;
- Where several parties are at fault and claimant is entitled to exoneration or contribution from others who have insurance and so it is inappropriate for the Government to pay; or
- Where other states have a liability under the UN Liability Convention.

We propose to consult around the detail of such examples. For instance, even if the starting point were to be not to indemnify in the case of operator wilful misconduct, an exception might be made where an operator becomes insolvent and members of the uninvolved general public would not be fully compensated as creditors in the insolvency.

[9] See definition of "injury or damage" in clause 68(1).

[10] Section 50915 of United States (51 US Code Ch 509) sets the limit in the legislation as $1.5 billion, uprated to reflect inflation from 1 January 1989.

Clause 35: Obligation to indemnify government etc against claims

Subsection 35(3)(a) provides a power to make delegated legislation to prescribe cases or circumstances where a licence condition cap under clause 11(2) on an operator's liability to indemnify the Government, pursuant to clause 35(1), will not apply.

Outline of the policy intent

Any limit on an operator's indemnity to the Government specified in a licence will not apply in prescribed cases or circumstances which will be set out in regulations. The reason for this power is to protect the Government's financial interests in situations where it is not appropriate to cap an operator's liability (e.g. in the case of wilful misconduct on the part of the operator).

Outline of the proposed content

It is proposed that the regulations will set out those situations where a cap on operator's liability will not apply. Subject to consultation, we anticipate such circumstances to include:

- Where the damage is a result of wilful misconduct on the part of the operator; or
- Where several parties are at fault and the operator is entitled to exoneration or contribution from others who have insurance that exceeds the cap.

Clause 37: Insurance

Clause 37(1) provides a power to make regulations requiring licensees and others to be insured in respect of risk and liabilities prescribed in regulations. These regulations may prescribe the matters to be covered by the insurance, matters that may or may not be excluded from the cover, the amounts of cover required and the quality of the insurance.

Clause 37(2) provides a power to make regulations (with the consent of HM Treasury) to provide for insurance or reinsurance schemes to be made available by the Secretary of State for the purpose of enabling persons to comply with the requirements for insurance as set out above or to comply with requirements in relation to insurance imposed in licence conditions.

Clause 37(8) provides a power to make regulations prescribing the conditions a security must satisfy to qualify as "insurance", for the purposes of satisfying any insurance obligations arising from regulations or licence conditions enabled by this Bill.

Outline of the policy intent

The Bill contains a provision for regulations to be made to require holders of licences and other persons engaging in spaceflight activities to be insured in relation to specified risks and liabilities. This provision is to ensure that there are available funds to meet claims up to the limit of liability for injury or damage caused as a consequence of the spaceflight activities and to protect the Government against those claims. Subsection (8) provides that alternative types of security can be accepted as a form of insurance and there is a power to make regulations stipulating the conditions that such a security must satisfy.

In light of concerns regarding the availability of insurance in the space and sub-orbital market, subsection (2) also contains a power for the Secretary of State to make regulations enabling the establishment of insurance or reinsurance arrangements to assist those engaging in spaceflight activities to comply with the insurance requirements.

Outline of the proposed content

The regulations under subsection (1) will set out those activities that give rise to certain risks and liabilities that the holder of a licence or other persons engaging in spaceflight activities will need to be insured against.

<u>Matters to be covered by the insurance</u>

Third party liability insurance

Holders of licences under this Bill will be required to hold third party liability (TPL) insurance. TPL insurance will be required to cover claims made by third parties for injury and damage arising out of all spaceflight and associated activities, whether such damage occurs on the surface of the earth, in airspace or in outer space. This insurance will also cover the operator's indemnity to the Government in respect of claims made against the Government. This follows the current licensing approach under the Outer Space Act 1986 where TPL insurance is required by a UK entity who

procures an overseas launch or operates a satellite in orbit. In addition to the requirement for TPL insurance, other types of additional insurance may also be required (see below).

Property insurance

Subject to consultation, we anticipate that holders of spaceport licences and range control licences will be required to hold insurance to cover activities carried out at a spaceport or range facility, including cover for damage to launch infrastructure.

Furthermore, parties involved in a spaceflight mission and in launch activities on a launch site will be required to take out insurance to cover their own property whilst at a spaceport.

Pre-launch insurance

Subject to consultation, we anticipate that satellite operators will be required to hold pre-launch insurance which is an insurance to cover their satellite as usually the satellite operator retains title and risk of the loss of the satellite usually to the point of launch during activities in the prelaunch phase (e.g. assembly, integration and testing, launch fuelling and integration of a satellite, etc).

Persons to be named as insured on an insurance policy

It is proposed that the regulations will also provide that the Government, a regulator and any other relevant bodies must be named as an additional insured on an insurance policy and also be able to benefit under the policy in the event of a claim brought against them.

We would like to explore further with industry and the insurance market how insurance and contractual allocation of risk between contracting parties will work best. In the context of ensuring there are no insurance lacunae in the contractual chain, we anticipate that there may either be a requirement to name certain persons (contractors, sub-contractors, customers, etc) in a licence holder's insurance policy or to procure that such persons have insurance themselves. In the United States, the former model of naming such persons as "additional insured" persons is provided for.[11]

Terms of the insurance policy

We would wish to prohibit terms that could invalidate the effect of any TPL policy that is intended to protect the Government and persons listed in clause 36(2). This would, for instance, cover exclusion clauses that would allow the insurer to avoid payment due to negligent or innocent non-disclosure by the operator. US legislation provides an example of mandatory terms that may be required in a TPL insurance policy for spaceflight activities[12] and we shall consult as to whether similar or different terms are appropriate for regulations in the UK.

[11] Electronic Code of Federal Regulations - Title 14
Aeronautics and Space, §440.9 Insurance requirements for licensed or permitted activities - https://www.ecfr.gov/cgi-bin/text-idx?SID=425432c670d4e090f2f20b1bbb6cd247&mc=true&node=se14.4.440_19&rgn=div8

[12] Electronic Code of Federal Regulations - Title 14
Aeronautics and Space, §440.13 - Standard conditions of insurance coverage - https://www.ecfr.gov/cgi-bin/text-idx?SID=311b16dce410f504c8055d4c853cf865&mc=true&node=se14.4.440_113&rgn=div8

Matters that may, or may not, be excluded from the cover required

Regulations made under subsection (1)(b) may set out the matters that are to be excluded from any minimum amount of insurance cover required as a licence condition. The purpose of the insurance requirement enabled by this Bill is to ensure that the Government and third parties are insured to the maximum extent that is commensurate with the risk and the insurance cover available on the market.

The minimum insurance requirement for third party liability insurance is not intended, for instance, to cover damages to the asset owned by the insured (e.g. the satellite owned) and the entire sum should be available for damage caused to third parties.

The amounts of cover required

If insurance is required, it is intended that the regulations will also set out how the amount of insurance will be calculated. This will involve an interface with the methodology to be developed in regulations for calculating the upper limit of a licensee's liability to third parties under clause 33(5). It may be that the insurance requirement is set at the same level as any liability cap. However, depending on the amount required by the regulator, it may not be possible to obtain insurance to cover the full amount of a person's capped liability. In these situations it may be that the insurance requirement is set at the maximum amount of cover available in the market. The residual uninsured liability could be covered by the operator's assets (in the event of damage and a subsequent claim) or by another financial security or by an arrangement supported by the Government as is provided for under subsections (2) and (3).

For TPL insurance for launch activities from the UK (both space and sub-orbital activities), it is proposed the regulations will provide that the insurance amount will be a minimum amount set on a case by case basis and determined on the basis of the level of risk and the activities involved in each mission.

In the US, the amount of insurance that an operator must evidence in order to be given a launch licence by the FAA depends on a maximum probable loss (MPL) assessment. See note on clause 33 (Liability of operator for injury or damage etc).

Subject to consultation, it may be that when determining the TPL insurance amount for launch activities from the UK, the UK adopts a type of MPL calculation. This may need to be adapted to take into account different considerations than that for launch from the US (e.g. how an MPL calculation would work with differences in population density and geographical location of the UK). Again, subject to consultation, it is considered that the regulations could set out that a launch vehicle operator (engaging in space activities or sub-orbital operations) will be required to obtain TPL insurance to the amount of an MPL calculation. Where it is not possible to obtain that amount of cover (because that amount is not available in the market), they will be required to take out the maximum amount of insurance available.

It is likely that a different approach to calculate the minimum insurance requirements for in orbit satellite operations will need to be taken as an MPL calculation may be difficult to determine for in orbit activities. As is currently the case, the regulations will set out that TPL insurance for in orbit activities will be assessed and set on a case-by-case basis. The amount required will depend on the

risks associated with that mission. A set of 'risk bands' provided for in regulations may provide indicative amounts of TPL insurance required for different types of missions. These bands would range from lowest-risk to highest-risk missions, corresponding to a low (or no) amount of TPL insurance required to the highest amount of TPL insurance required

It is proposed that the regulations will provide that the minimum insurance requirements will be specified within a licence and will provide the duration for which insurance is expected to be held. For example, for launch, TPL insurance may be required for the duration of the launch and for the duration in which upper stages (from vertical launch) remain in orbit (before re-entering or burning up on re-entry). For certain in-orbit operations of a satellite, the regulations will set out that the TPL insurance may be required for the duration of the mission and possibly longer depending on the risks involved.

Subsection (8) provides that a reference to insurance includes a reference to security that satisfies prescribed conditions. It is proposed that the regulations will therefore prescribe the conditions that a security must satisfy to be accepted as a form of insurance. Subject to consultation, such a security must be guaranteed to meet the minimum insurance requirement.

Subsection (2) provides a power to make regulations to enable insurance or reinsurance schemes to be made available by the Secretary of State. The Government is already involved in various models of reinsurance scheme, covering matters such as flood and terrorist risk. These reinsurance schemes have been designed to address potentially large claims, which commercial insurers have been unable or unwilling to insure for. The setting up of such arrangements for spaceflight by way of regulations under this Bill would require HM Treasury consent. The Government does not propose to immediately establish insurance or reinsurance arrangements and is keen to see the commercial insurance market develop in response to spaceflight business opportunities. However, this power provides a tightly controlled flexibility to respond if there are circumstances of market failure that require some intervention. Were any insurance or reinsurance arrangements to be made available by regulations, such regulations would also provide for funding mechanisms such as the payment of a premium.

Approach to preparation and timing

The Department for Transport and the UK Space Agency are working closely with the Government Actuary Department and specialist space insurance advisors with regard to insurance requirements under this Bill. This work will continue with the aim of consulting industry in relation to the specific content of any regulations.

Clause 38: Powers to obtain rights over land

Clause 38(1) and (5) gives the Secretary of State power to make an order creating rights over land, subject to certain conditions, including rights of entry and to make consequential, incidental and supplemental provisions.

Outline of the policy intent

The purpose of this clause is to allow the use of land in the vicinity of a spaceport to the extent that it may be needed for the spaceport to operate safely and efficiently, including for the launch and landing of vehicles.

This clause is analogous to section 44 of the Civil Aviation Act 1982 ("the 1982 Act") but refers to spaceflight activities, spacecraft and carrier aircraft rather than aviation and aircraft. It is therefore likely that the power will be used (if at all) only in relation to those spaceports which are not co-located with an aerodrome as the power in section 44 of the 1982 Act could be used instead for aerodromes.

It is intended that the power would be used to enable the provision of services such as electricity or gas supplies to a spaceport and the installation on other land of facilities for the navigation and safe monitoring of spaceflight activities (e.g. radio masts).

Such a power will only be used as a last resort. The guiding principle is that spaceflight activities in or from the UK are commercially driven. As such, the Government expects that commercial arrangements should be in place in most circumstances to allow for the necessary access on the relevant land. Only where such arrangements cannot be agreed would the range control or spaceport licence holder be able to obtain an order from the Secretary of State.

Outline of the proposed content

The order made in a particular case will depend on the circumstances and the specific requirements of the spaceport or space activities concerned. The following examples are illustrative.

- Example 1: the holder of a range control licence may require the installation of a critical piece of technical infrastructure, such as a radar or telemetry station, to be positioned in a particular location. That location may be some distance away from the spaceport and in private ownership. If the owner of the land where this infrastructure is to be positioned refuses to enter into discussions or to agree a reasonable settlement with the holder of the range control licence, that licence holder may apply to the Secretary of State to make an order to permit the installation.
- Example 2: a planned spaceflight activity may require large sub-assemblies, such as rocket stages, to access a spaceport complex via a road or rail network. These would be abnormal loads and may require alterations to roads or railways nearby. If the landowner across whose land these loads must pass refuses to come to an agreement, the spaceport licence holder may apply to Secretary of State to make an order to permit the access.

Further procedural detail on the making of any order under clause 38 is contained in Schedule 6, which also applies to any order made under clause 40.

Clause 40: Power to restrict use of land to secure safety

Clause 40(1) confers on the Secretary of State power to make an order imposing prohibitions or restrictions on the use of land or water (excluding tidal waters beyond the territorial sea adjacent to the UK) in certain cases to ensure that the launch or landing of spacecraft or carrier aircraft may be conducted safely at a particular spaceport or to prevent the launch or landing of spacecraft or carrier aircraft from endangering persons or property.

Outline of the policy intent

The purpose is to enable the safe launch and landing of spacecraft or carrier aircraft at the spaceport specified in the order by ensuring that the use of land or water in the vicinity by third parties is limited when spacecraft are launching or landing. Restrictions of this sort will be time limited and imposed only so far as is necessary to ensure that people and property are not exposed to an unacceptable level of risk.

The relatively high level of uncertainty around spaceflight activities (at least in comparison to conventional aviation) means that the principal way to secure public safety – which is the primary duty of the regulator as stated in clause 2(1) – is to limit the number of individuals within the vicinity of high risk activities.

Detailed risk calculation methodologies for spaceflight are being drawn up by the Health and Safety Laboratory. These will recommend best practice for calculating areas around a launch site and the flight path of any vehicle which are at risk. In order to secure that risk is managed to be as low as reasonably practicable, it is possible that access will have to be restricted to certain areas in the time around a launch.

Such a power will only be used as a last resort. The guiding principle is that spaceflight activities in or from the UK are commercially driven. As such, the Government expects that commercial arrangements should in most circumstances be sufficient to ensure that spaceflight activities can be carried out.

If safety requires it, the operator will be expected to secure the use of land nearby, by way of commercial negotiations, before a licence is granted. For example, if there is a piece of land near to the spaceport that is owned by a local farmer and use of this land has to be restricted to prohibit access to it at the time of launch then, in the first instance, it is up to the operator to agree this with the farmer and compensate him or her. Only if the farmer refuses to enter into such an agreement would the use of this power be contemplated. This power would therefore be used only as a last resort, where the operator can demonstrate that it was impossible to come to an agreement with the relevant land owner.

That notwithstanding, the power is necessary to ensure that safety can be secured in instances where agreement cannot be reached and the operator can demonstrate that it has used all reasonable endeavours to reach an agreement. The operator will also have to demonstrate that such a power would not be used to impose an unreasonable burden on the occupier of the land or users of the water.

To ensure that any such restrictions are subject to proper scrutiny and transparency, Schedule 6 requires the publication of an order and the serving of a copy of that order to anybody likely to be affected. Affected persons are entitled to object to the order.

The power in this clause is analogous to that which is available under section 45 of the Civil Aviation Act 1982 ("the Act 1982"). However, it refers to spacecraft and spaceports, whereas the provision in the 1982 Act is confined to aircraft and aerodromes.

Outline of the proposed content

The order made will depend on the circumstances and specific requirements. However, in any event, the restrictions imposed would be time limited and confined to the area necessary to ensure the acceptable level of risk.

As an example, a person with land in the vicinity of a spaceport may be restricted from carrying out work in all or part of that land around the time of a 'launch window'. A launch window for polar or sun synchronous orbit – which are the feasible types of orbit for which we envision launch from the UK – is a matter of hours and, for operational reasons, must be known with some precision well in advance.

Approach to preparation and timing

The timing of the order will depend on the circumstances and specific requirements. As soon as a launch had occurred and concluded or, in the case of landing, as soon as the craft had safely landed, the restriction could be lifted.

Clause 45: Special provisions relating to statutory undertakers, including Schedule 9

Clause 45 gives effect to Schedule 9 which makes provision in relation to orders made under clauses 38 or 40 affecting statutory undertakers.

Paragraph 4(1) of Schedule 9 provides a power to make an order to facilitate the adjustment of the carrying on of an undertaking.

Paragraph 5(1) of Schedule 9 provides a power to make an order directing that a statutory undertaker is relieved from an obligation absolutely or to a specified extent.

Outline of the policy intent

The provisions under this Schedule are intended to ensure that statutory undertakers may carry on their business effectively in response to orders under clauses 38 and 40.

They correspond to the powers under section 51 of the Civil Aviation Act 1982 ("the 1982 Act"). Where a spaceport is located at an aerodrome site, these powers therefore already exist; where a spaceport is used solely for spaceflight activities not involving aircraft, equivalent provisions are required. The powers in Schedule 9 have been drafted to ensure equivalence with the 1982 Act to avoid artificial differences between different spaceports.

Paragraph 4 enables the Secretary of State to make an order to extend or modify the duties and powers of a statutory undertaker, if an adjustment of the carrying on of an undertaking is necessary because of any order made under clauses 38 or 40. An order may also contain incidental and supplementary provision.

Orders made under paragraph 5 enable the Secretary of State to relieve the statutory undertaker of obligations to which that person would otherwise be subject. This is necessary in circumstances where an order made under clauses 38 or 40 conflicts with a statutory undertaker's existing obligations, for example to continue supplying utilities to third parties.

Outline of the proposed content

The precise changes that might be required to a statutory undertaker's obligations will, of course, depend upon the nature of those obligations and the order made under clause 38 or clause 40. For that reason, they cannot be predicted in advance. However, we anticipate that such a power would be used if an order under clause 38 or clause 40 would prevent a statutory undertaker from using land it had previous used for its undertaking (for example, where it accessed pipes, cables or points for maintenance) and thus would interrupt services to third parties. The Secretary of State could then use the powers in paragraphs 4 and 5 of Schedule 9 to modify the powers and duties of the statutory undertaker or to give it powers to acquire land to carry out their undertaking as modified (e.g. using other nearby land to reroute pipes or cables).

Clause 51: Offences on board spacecraft: supplementary

Clause 51(1) provides, firstly, that regulations may provide for certain existing legislative provisions to apply to spaceflight (either with or without modifications) when they otherwise would not and, secondly, that regulations may make provision corresponding to certain existing legislative provisions.

Outline of the policy intent

The intent is to apply sections 94 (powers of commander of aircraft) and 95 (provisions as to evidence in connection with aircraft) of the Civil Aviation Act 1982 ("the 1982 Act"), and subsections (4) and (5) of section 92 as they apply by virtue of section 95(5) to that Act, to manned, sub-orbital spaceflight activities, subject to the modifications described below.

As sub-orbital spaceflights will be manned, it is necessary to provide the commander of the spacecraft with powers of restraint over passengers on board in certain situations analogous to those mentioned in section 94 of the 1982 Act. In addition, where there are proceedings before a court in the UK in respect of an offence alleged to have been committed on board a manned sub-orbital spacecraft, and the testimony of a witness to that alleged offence is required and that witness is not in the UK, a deposition may be required in evidence from the witness under the procedure set down in section 95 of the 1982 Act, as applied under regulations made under this clause.

Outline of the proposed content

Section 94 of the 1982 Act

Section 94 of the 1982 Act gives the commander or pilot-in-command[13] of an aircraft certain powers over any person carried on board the aircraft, wherever it may be, if he has reasonable grounds to believe:

- the person has done or is about to do anything on the aircraft, while it is in flight[14], that jeopardises or may jeopardise the safety of the aircraft or persons or property on board it or good order and discipline on board; or
- that the person has done on the aircraft, while it is in flight, any act which in his opinion is a serious offence under any law in force in the country in which the aircraft is registered, other than a law of political nature or a law based on racial or religious discrimination.

[13] Defined in section 94(7) as, respectively, the person designated as commander by the operator of the aircraft, or failing such designation, the pilot-in command, and the person who is for the time being in charge of the piloting of the aircraft without being under the direction of any other pilot in it. For brevity, this note uses the term 'commander' to refer to both.

[14] Defined in section 94(8) as being from when all external doors of the aircraft are closed following embarkation for a flight until the doors are opened for disembarkation after the flight and, if there is a forced landing (not defined) until the competent authorities of the country where the landing takes place take over responsibility for the aircraft and persons and property on board it it, or in the UK until a police constable, arrives at the lace of landing.

The powers conferred are to take such reasonable measures, including of restraint, as may be necessary:

- to protect the safety of the aircraft or of persons or property carried in it;
- to maintain good order and discipline on board; or
- to enable the commander or pilot-in-command to disembark the person in any country the aircraft happens to be (where 5(a) above applies) or to deliver the person to a police officer immigration officer of the UK or of any other country that is a contracting State to the Chicago Convention ("Convention country") (where 5(b) above applies).

Where the commander disembarks the person, the commander must inform the authorities of the country of disembarkation and the diplomatic or consular authorities of the country of nationality of the person.

Where the commander delivers the person to a police officer or immigration officer - in the UK or, in the case of British-controlled aircraft, in any other country which is a Convention country - the commander must, before landing or as soon as practicable after landing, notify the police or immigration authorities of the country where he intends to deliver the person, including the UK where that is the country, and also the diplomatic or consular offices of the person's country of nationality.

A commander of an aircraft who fails to comply with either of the above requirements is guilty of an offence and liable on summary conviction to a fine not exceeding level 3 on the standard scale (£1,000).

Section 94(3) and (4) of the 1982 Act also confer a power on any other member of the aircraft crew, and on any other person on board the aircraft, at the request of the commander, to render assistance in restraining the person whom the commander is entitled to restrain. Furthermore, such crew members or other person may, while the aircraft is in flight, take such reasonable measures mentioned above, which that crew member or person has reasonable grounds to believe are necessary to protect the safety of the aircraft or of persons or property on board it. The effect of this section of the 1982 Act and the powers it confers (which are derived from the Tokyo Convention 1967) is that persons who exercise the powers in accordance with the section are immune from suit or prosecution for assault or false imprisonment.

Regulations made under clause 51 will apply section 94(1) to (6) of the 1982 Act to spacecraft engaged in manned, sub-orbital activities with the following modification that there will be no need to include provision for a British-controlled spacecraft or for references to a Convention country. This is because they will be purely UK operations.

It is planned that only sub-orbital spaceflights that take off and land from the same spaceport within the UK are to be licensed. However, it will be necessary to allow for disembarkation elsewhere in case of an emergency diversion.

There will be an offence in corresponding terms to section 94(6) in terms of failure of a spacecraft commander to inform or notify the relevant authorities when disembarking or delivering a person from the spacecraft. The mode of trial and penalty will be the same.

Section 95 of the 1982 Act

Section 95 of the 1982 Act makes provision for evidence to be admissible in court in proceedings for an offence committed on board an aircraft where the testimony of a person is required and the court is satisfied the person is not in the UK.

Section 95(5) provides that section 92(4) and (5) apply for the purpose of section 95:

- Section 92(4) sets out the meaning of the period during which an aircraft is in flight. This includes any period from the moment when power is applied for aircraft take off until the moment when the landing run (if any) at the termination of that flight ends; and includes a reference to an aircraft during any period when it is on the surface of the sea or land but not within the territorial limits of any country.
- Section 92(5) provides a definition of "aircraft" for the purposes of the section.

Section 95 will be applied by the regulations to be made under clause 51 to spacecraft engaged in manned, sub-orbital activities, with the following modifications:

- Subsection (1)(b) will be modified so as to apply to any country (rather than Commonwealth countries only).
- Subsection (4), which provides for a UK consular officer to inquire into an allegation that an offence has occurred on a British controlled aircraft outside the UK or an act or omission that is an offence under section 92(1) of the Civil Aviation Act 1982 has occurred on a foreign aircraft, will be applied but with modifications to section 92(4) and (5) as it applies by virtue of section 95(5) as follows:
    - subsection (4) will be modified so it includes a spacecraft being launched from a carrier aircraft as well as by a horizontal take-off;
    - all references to aircraft will be replaced by references to spacecraft;
    - the reference to the air navigation enactments will be removed as these are not relevant to section 95; and
    - the definition of British-controlled aircraft will be changed to remove the references to registered aircraft (there will not be a register of spacecraft) and so that the sole criteria is whether the operator of the spacecraft is resident or has its principal place of business in the UK.

Clause 53: Offences under regulations

Under clause 53(1), regulations under the Bill may:

- create offences;
- provide for offences under the regulations to be triable only summarily, or either summarily or on indictment ("either way") ;
- provide for offences triable either way to be punishable:
    - on indictment, with imprisonment for a term not exceeding two years (or, in the case of a provision about endangering a spacecraft or persons in a spacecraft, a term not exceeding five years), or with a fine, or both;
    - on summary conviction in England and Wales with a fine, or in Scotland or Northern Ireland with a fine not exceeding the statutory maximum;
- provide for summary only offences to be punishable:
    - in England or Wales with an unlimited fine, or with a fine not exceeding a prescribed amount, which must not exceed level 4 on the standard scale (£2,500);
    - in Scotland or Northern Ireland, with a fine not exceeding a prescribed amount, which must not exceed level 5 on the standard scale.

Clause 53 is subject to clause 51(3) and (4), paragraph 6(2) and (3) of Schedule 3 and paragraph 4 of Schedule 5:

- Clause 51(3) and (4) (offences on board spacecraft: supplementary) limit the power under clause 51(1) to apply with modifications an enactment creating an offence (in sections 94 and 95 of the Civil Aviation Act 1982). The limitations so imposed exclude the power to modify the mode of trial for the offence, or specify greater penalties for it.
- Paragraph 6(2) and (3) of Schedule 3 (safety regulations: further provision) limits the power under paragraph 6(1)(b) and (c) of that Schedule to apply sections 92 to 94 of the Railways and Transport Safety Act 2003 with modifications or make corresponding provision in relation to spaceflight activities. The limitations so imposed exclude the power to modify the mode of trial for the offence, or specify greater penalties for it.
- Paragraph 4 of Schedule 5 (security regulations: further provision) limits the power under that Schedule to apply with modifications an enactment creating an offence. The limitation so imposed excludes the power to modify the mode of trial for the offence, or specify greater penalties for it.

Outline of the policy intent

The policy intent of the regulations is to provide an enforcement regime in relation to the requirements set out in regulations and to specify the associated penalties. This is in order to secure effective regulation of such activities.

Outline of the proposed content

It is proposed that the regulations will set out the offences applying to breaches of requirements for the provision of spaceflight activities, spaceports and range control services which are not otherwise provided for in primary legislation.

The majority of the offences in the regulations will relate to whether a person has complied with specific requirements under the Bill (e.g. in relation to safety or security). It is envisaged that this would include, for example, an offence of negligently or recklessly endangering a spacecraft or any person in it. Such an offence may carry a sentence of up to 5 years imprisonment and/or a fine.

Other specific offences may include:

- negligently or recklessly causing a spacecraft to endanger persons or property on the ground;
- obstructing a regulator or authorised person in the execution of any duty, for example requiring the production of certain documents, records, inspection and taking of copies;
- being drunk or under the influence of psychoactive substances in a spacecraft;
- breaching prohibitions on smoking in or near a spacecraft;
- interfering with the flight crew of, or acting disruptively on, a spacecraft; and
- offences in relation to documents and records such as knowingly making a false representation in order to obtain any approval or permit (for example a permit or licence to fly a spacecraft), or altering or forging any document or record a person is required to keep and produce for inspection with intent to deceive.

Approach to preparation and timing

It is envisaged that the general approach will be similar to the Air Navigation Order 2016 (in particular article 265 and Schedule 13) where for each requirement applying to a person, there is a related offence if the requirement is not met. Offences will be graded in terms of their seriousness, from summary only offences for which there will be specified fines (for example, for obstructing a regulator or authorised person in the execution of any duty, for example requiring the production of certain documents, records, inspection and taking of copies); to triable either way offences, for which there will be either a fine or a sentence of imprisonment for a term not exceeding two years. An exception to this is referred to above in the case of a provision about endangering a spacecraft or persons in a spacecraft (up to five years' imprisonment).

Clause 55: Defences

Clause 55(4) provides that regulations that create offences under the Bill may also provide for defences in relation to those offences.

Outline of the policy intent

The Bill includes several offences under clauses 3(6) and (7), 7(8) and (9), 12(8), 16(4), 17(6) and (7), 23(8), 30(3), 31(9), 32(8), 39(2) and (3), 40(4), 41(5), 65(5), Schedule 4 and paragraph 9(5) of Schedule 9.

The Bill provides that regulations creating offences under this Bill may also create defences for those offences. A defence is grounds on which a person who has been charged with an offence may contest their culpability for the offence. Under clause 55(1) and (2), being able to demonstrate that the person exercised all due diligence and took all reasonable precautions to avoid committing the offence is a defence, as long as there is sufficient evidence and the contrary cannot be proved beyond reasonable doubt.

However, given the complex and bespoke nature of spaceflight activities it will be necessary to create further offences through regulations in relation to matters such as safety and security (see note for clause 53). Therefore this power will be used to create corresponding defences.

Outline of the proposed content

The majority of the offences created under regulations will relate to situations where a person has failed to comply with a relevant requirement under the regulations (such requirements may relate to safety, security or some other matter). The types of offences that can be included in regulations are set out in the previous note for clause 53. The regulations made under clause 55(4) will set out any defences that may apply to these offences.

The defences applicable to offences created by regulations will depend on those offences, which are not yet known. However, it is envisaged that for many offences, the regulations will create defences similar to those provided for in paragraphs (2) and (3) of article 265 of the Air Navigation Order 2016. These provide that:

- where the offence occurred without a person's consent or connivance and that person has exercised all due diligence, no offence is committed; and
- an act or omission will not be deemed to be a contravention by the person in question of a relevant provision if it is proved that an act or omission was due to any cause not avoidable by the exercise of reasonable care by that person.

A similar defence is already expressly provided for in respect of certain offences that appear on the face of the Bill.

The regulations may also set out where a defence does not apply. This could be in cases where a person knowingly makes a false statement or intentionally commits an offence.

Clause 58: Civil sanctions

Clause 58(2) provides a power to make regulations making any provision in relation to an offence under this Bill, including in regulation made under the Bill, that could be made under Part 3 of the Regulatory Enforcement and Sanctions Act 2008 ("the 2008 Act") as if a) the regulator were a regulator for the purposes of Part 3 and b) the offence were a relevant offence in relation to the regulator for those purposes. This power extends to an offence under regulations made under this Bill, excluding an offence under Schedule 4 (offences against the safety of spacecraft etc).

Outline of the policy intent

The intention is to provide a speedy and tailored approach to enforcement, with civil sanctions available for less serious breaches of regulatory offences.

Outline of the proposed content

The regulations could include any type of provision listed under Part 3 of the 2008 Act:

- The range of sanctions that are available:
    - fixed monetary penalties;
    - discretionary requirements;
    - stop notices[15];
    - enforcement undertakings; or
    - a combination of these sanctions, where this is permitted;
- Procedures to be adopted before imposing a civil sanction;
- Enforcement and recovery procedures;
- Special provision with regard to the devolved administrations (for instance, excluded provisions or consultation); and
- Any other supplementary and general provision permitted under the powers in Part 3 of the 2008 Act, such as guidance, consultation, powers of entry and publication of enforcement action.

Part 3 of the 2008 Act makes provision for what regulations creating civil sanctions must do and these conditions will apply to regulations under this clause. In particular clause 58(4) applies sections 63 to 69 (guidance, exercise of powers and payment into Consolidated Fund) to provisions made under clause 51 as they apply to Part 3 of the 2008 Act[16].

A number of civil sanctions regulations have been made under Part 3 of the 2008 Act: see, for example, the Environmental Civil Sanctions (England) Order 2010 ("the 2010 Regulations") and the Marine Licensing (Civil Sanctions) (Wales) Order 2011. Any regulations made under Clause 58 will

[15] Under clause 58(3), references in section 46 of the 2008 Act (stop notices) to any of the matters referred to in subsection (6) of that section are to be read as references to public safety, persons carried on board spacecraft or carrier aircraft, persons at work at spaceports, mission management facilities or sites used in connection with provision of range control services, the interests of persons in relation to use of land, sea and airspace and of persons with interests in property carried by spacecraft.

[16] Section 68 of the 2008 Act (suspension of civil sanction powers) does not apply where the regulator is the Secretary of State.

probably contain similar procedural, appeal, enforcement and cost recovery provisions to those regulations.

Subject to consultation, it is intended that fixed monetary penalties will be provided for use against individuals in relation to the offence of breaching a licence condition under clause 12(8) where the breach does not constitute a serious offence. For example:

- Failure to allow the inspection of documents, sites or facilities;
- Failure to provide access to specified meetings if this is provided for as a licence condition;
- Failure to provide updated information when requested (e.g. annual health check of licensed satellites in orbit or updated insurance policies);
- Failure to maintain proper records of licensed activity; or
- Failure to notify of any changes to the licensee's status that may affect the ability to perform against obligations under a licence (e.g. financial difficulties or company restructures).

Under the 2008 Act a fixed monetary penalty cannot exceed the amount of the fine that may be imposed on summary conviction.

Discretionary requirements under Part 3 of the 2008 Act are: variable monetary penalties (of such amount as the regulator may specify), requirements to take such steps as the regulator may require to ensure an offence does not continue or re-occur and requirements to take such steps as the regulator may require to ensure that the position is restored, as far as practicable, to what it would have been if an offence had not occurred.

Discretionary requirements might be applied to breaches of licence conditions (breach of licence condition is an offence under clause 12(8) of this Bill), breaches of specified safety, security and training requirements under regulations made under clauses 17, 18 and 22 and under clauses 39, 40 and 41 of this Bill.

Enforcement undertakings are undertakings from a person to a regulator to take specified actions in order to ensure an offence does not continue or recur, to restore the position to what it was before the offence occurred, action to benefit a third person (including payment of money) or to take action of a prescribed description.

Regulations for civil sanctions may create enforcement undertakings for breaches of licence conditions and specified safety, security and training requirements under regulations made under clauses 17, 18 and 22 and under clauses 39, 40 and 41 of this Bill.

Some offences will probably not be subject to civil sanctions, on the basis they are so serious they should only be dealt with by a court of law (e.g. breach of clause 3(1) (unlicensed spaceflight activities) and any offence of endangering a spacecraft or persons in a spacecraft under clause 51(4)).

Clause 59: Appeals, including Schedule 10

Clause 59 provides that Schedule 10 makes provision for appeals against decisions under this Bill and under the Outer Space Act 1986 ("the 1986 Act") and provides for the establishment of appeals panels for decisions to consider such appeals.

Schedule 10 provides that regulations must make provision for the establishment of one or more panels to consider appeals. The regulations may make provision for the composition of the panel including the appointment of the panel Chair.

Schedule 10 goes on to provide a power for regulations to:

- prescribe other decisions that are appealable to a panel. These decisions are decisions of the regulator under the Bill or under regulations made under the Bill and any other decisions of the Secretary of State under the 1986 Act;
- to prescribe persons who can bring an appeal under paragraph 4;
- to prescribe the period within which an application for permission to appeal may be made;
- to prescribe the form and time of a determination of a panel and persons to whom copies of the determination must be sent and about the publication of determinations;
- to prescribe the period within which a panel must determine an appeal;
- to prescribe the period within which the relevant person must make representations in writing;
- providing for the conduct and disposal of appeals; and
- to prescribe fees payable in respect of matters dealt with by a panel.

Outline of the policy intent

The purpose of this clause and the Schedule is to provide a route of appeal against certain decisions under both the Bill and the 1986 Act (as there is currently no appeals process under the 1986 Act). This is to ensure applicants have a clear and transparent route to appeal which avoids imposing a burden on the tribunal services.

Regulations will also provide for the recovery of costs incurred in providing an appeal system.

Outline of the proposed content

<u>Regulations relating to the panel and their membership</u>

It is proposed that the regulations will provide that a panel must be established to hear an appeal. These regulations will include provisions in relation to the composition of the panel.

For appeals against decisions set out in paragraph 3 of Schedule 10, it is intended that such a panel will be made up of experts that have the technical ability to consider the appeal (e.g. if an application for a licence is refused because there are safety concerns regarding the use of hazardous materials, there should be an expert on the panel with knowledge of the use of such materials). The regulations will set out how the panel will be appointed and require that panel members have not previously been involved in the decision being appealed.

Regulations for decisions that are appealable and persons entitled to appeal

Regulations will set out the additional categories of decisions that can be appealable beyond those listed in paragraph 3 of Schedule 10 and the persons who may bring an appeal. We will consult on our proposed approach to this framework.

Time limits on bringing an appeal

It is proposed that the regulations will stipulate that a person must make an appeal within 14 days of receiving an appealable decision. The regulations will also outline the circumstances when an out of time appeal may be made (e.g. when a person can demonstrate they did not receive a decision document, an appeal was made but wasn't received or any other extenuating circumstances). The regulations will allow for a panel to accept an out of time appeal if it deems it appropriate.

Procedural regulations

It is proposed that the regulations will include provisions on the conduct and management of appeals, including that a case handler or secretariat will be appointed when an appeal is made to liaise with the appellant as necessary, to arrange an appeal hearing (where necessary), to ensure all parties have the relevant document bundles and to perform other such functions.

The procedural regulations will set out that the appellant must provide written representations within 14 days of lodging the appeal and provide for the panel to accept representations after that period if it deems it appropriate to do so.

It is proposed that the regulations will also set out the types of appeal and where an appellant is able to make oral representations at an appeal hearing and call witnesses. This is likely to be for decisions that are appealable under paragraph 3 of the Schedule 11.

It is proposed that the regulations will provide for sharing of bundles of documents in advance of an appeal hearing and submission of further documents only with the express permission of the panel.

It is proposed that the regulations will also set out when there is to be no appeal hearing and where the determination is made based on written evidence and representations.

Time limits on making a decision

It is proposed that the regulations will also set out the time limit for the panel to communicate its decision via a written notice to the appellant. For non-technical decisions, the intention is that an appeal determination should be made within 28 days of the appeal hearing.

A determination should be provided to the appellant in writing and for certain decisions, published on the relevant Government or regulator website.

It is proposed that the regulations will also provide that an appellant has the right to request a private hearing in cases involving commercially sensitive material and can request that a redacted copy of a determination is published.

It is proposed that the regulations will also provide for when an appeal should be conducted privately if it concerns sensitive material.

Fees

It is proposed that the regulations will also prescribe the fees payable for considering an appeal. This will be a fixed fee and include the cost of the case handler or secretariat to manage the appeal to arrange a hearing and costs incurred by panel members.

Clause 61: Charging schemes, including Schedule 11

Clause 61 gives effect to Schedule 11 which makes provision for schemes for making charges in respect of the performance of functions conferred on the Secretary of State or on the regulator by or under the Bill.

Paragraph 2 of Schedule 11 provides a power for the Civil Aviation Authority (CAA) to make a scheme providing for payment of charges in respect of the performance by the CAA of functions conferred by or under this Bill and specified in the scheme.

Paragraph 3 of Schedule 11 provides a power for the Secretary of State to make regulations containing a scheme providing for payment of charges in respect of the performance by the Secretary of State, or an appointed person other than the CAA, of functions conferred on the Secretary of State or the appointed person by or under the Bill and specified in the scheme.

Outline of the policy intent

Although this is not expressed on the face of the Bill, it is intended that space activities will be regulated by the Secretary of State acting through the UK Space Agency (UKSA) and sub-orbital activities by the CAA. The overall licensing responsibility for "hybrid missions" will fall to the UKSA with input from the CAA where necessary. The attribution of responsibilities between the UKSA and the CAA will be implemented by way of an agreement.

The CAA will therefore develop charging schemes under paragraph 2 of Schedule 11 in connection with functions conferred on it by or under the Bill administratively as it would do under section 11 of the Civil Aviation Act 1982.

The UKSA will develop charging schemes by regulations under paragraph 3 of Schedule 11, enabling the Secretary of State or an appointed person (other than the CAA) to charge for carrying out functions conferred by or under the Bill.

Currently, the UKSA regulates space activities under the Outer Space Act 1986 ("the 1986 Act"). Paragraph 9 of Schedule 12 of the Bill amends the 1986 Act to provide a power to make regulations setting out a charging scheme for activities regulated under the 1986 Act. The purpose of this amendment is to ensure that the same charging regime applies to licences for space activity issued under both the 1986 Act and the Bill for consistency.

The charging schemes will be based on the following principles:

- Transparency for applicants within the different schemes, ensuring that all costs in the schemes are broken down and published so as far as is possible.
- Fees should be fair and based on the services an applicant is using.
- Where possible, fees should incentivise safer missions. However, the fee will reflect the cost of providing the service and there will be no cross-subsidies.

- Fees will be based on cost recovery and in line with the provisions in Managing Public Money (MPM)[17].
- If the regulator is the CAA, the fees will include a 3.5% return on capital employed which the CAA is currently required by HM Treasury to make.

Outline of the proposed content

The charging schemes will cover fees charged for processing an application, issuing a licence and ongoing monitoring and compliance costs post-issue of a licence.

The schemes will set out the charges payable by an applicant before a licence is issued. There will also be schemes in relation to the compliance and monitoring costs a person will be required to pay post-issue of a licence. Different schemes will apply to different types of missions and applications. Subject to consultation the types of schemes could include:

- A scheme for licensing a spaceport;
- A scheme for monitoring compliance of the operation of a spaceport with licence conditions;
- A scheme for operating a launch vehicle (per mission);
- A scheme for licensing the operation of a satellite in orbit;
- A scheme for monitoring compliance of the operation of a satellite in orbit with licence conditions;
- A scheme for licensing a range control service provider; or
- A scheme for monitoring compliance of range control service providers with licence requirements.

Alternatively the costs of licence issue and monitoring could be combined in a single scheme (per category of licensed activity).

Again, subject to consultation, regulations will set out that charging schemes will be based on a mixture of fixed fees, hourly rates and the pass on of other third party costs or disbursements.

The fixed fee element of the charging scheme could include the administration costs in processing a licence (e.g. staff costs, office costs, IT and apportioned general overhead costs). Spaceflight policy costs can be included in CAA charging schemes but not UKSA charging schemes, unless they related to the executive delivery of the service.

The third party costs that are passed on could include where external advice has been obtained (e.g. external technical advice or external advice on insurance policies and financial information).

Finally, an hourly rate could be calculated for internal technical assessors and inspectors. This would be based on the same principles as the fixed fee element.

Subject to consultation, the fee could also include start-up costs, including the potential investment costs incurred by Government to establish or licence a range facility (if no commercial undertaking

17 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/454191/Managing_Public_Money_AA_v2_-jan15.pdf

comes forward to be licensed as a “range controller”, it is possible that Government may perform this function and the Bill would permit this). These would be recovered as depreciation costs.

All charges will be based on cost-recovery in line with the principles outlined in the Government’s MPM (if the regulator is the Civil Aviation Authority, the amounts recovered should include the 3.5% rate of return on capital employed).

The regulations and the CAA scheme will set out when the fees are to be charged. Subject to consultation, fees are likely to be structured such that the fixed fee (or part of it) would be charged at the point that an application is submitted. Where part of a fixed fee was payable at licence application, the rest of the fixed fee may be spread over certain milestones in the licensing process. Third party costs and the hourly rate of internal technical assessors and inspectors would be invoiced periodically as and when they are incurred or, alternatively, at the end of the licensing process, depending on the charges incurred. The aim of this approach is that as far as is possible, a licence applicant will pay for work undertaken to date on their application in the event that they chose to discontinue their application at any stage of the process. However, part of the fixed fee would be payable upfront before any work begins on an application.

Where a charging authority works jointly with other Government departments, the primary regulator and charging authority will recover those costs from the applicant by way of a scheme and reimburse the other bodies for their services.

In terms of hybrid missions (e.g. where a rocket carrying a satellite is attached to a carrier aircraft), UKSA will have the overall licensing responsibility and will charge an applicant as per its charging schemes. The charges will include the element of costs incurred by the CAA for its part of the authorisation of the carrier aircraft and these will be passed on to the CAA in accordance with the terms of a memorandum of understanding.

Approach to preparation and timing

The Bill provides under paragraph 5 of Schedule 11 that before making a scheme, the CAA or the appointed person must consult those persons who are likely to be affected by the Scheme and must also consult the Secretary of State. Furthermore, before making regulations under paragraph 3, the Secretary of State must consult those likely affected by the scheme and others the Secretary of State thinks fit. The Secretary of State must also consult the charging authority (the person to whom the scheme provides for payments to be made, if this is not the Secretary of State).

Regulations for charging schemes (needed for regulators other than the CAA) will be made by way of statutory instrument by the negative resolution procedure.

Clause 64: Agreements with other countries: compliance with requirements etc

Clause 64(1) confers a power to make regulations to provide that compliance with a prescribed requirement or prohibition, imposed to give effect to an agreement with another country relating to spaceflight activities, may in prescribed conditions and circumstances, be taken as compliance with a prescribed requirement or prohibition imposed by subordinate legislation. Subordinate legislation is defined in the Interpretation Act 1978 section 21(1) (i.e. Orders in Council, orders, rules, regulations, schemes, warrants, byelaws and other instruments made under any act).

Outline of the policy intent

The intention is to ensure that operators are not subjected to additional tests in the UK to meet standards and requirements, where it can be demonstrated that these are already being met or exceeded by virtue of compliance with an agreement with another country.

For example, a US vehicle operator will already be complying with certain conditions to meet Federal Aviation Administration (FAA) licensing requirements. An agreement with the US for the sharing of information between regulators and recognising certain facets of US regulation would enable the UK to accept compliance with FAA conditions, where they are equivalent to or more stringent than the relevant UK standards.

The FAA already imposes a condition that US operators must be licensed under their regime when operating outside of the US, so duplication of any FAA process to meet UK requirements could be a disincentive to operate in the UK.

It is acknowledged that this recognition of compliance will not always be appropriate, hence the stipulation of prescribing circumstances and conditions where this would be acceptable. It should be noted that the US is not the only country with whom such agreements could be made. In either case there will still be a requirement for the regulator to issue a UK licence, to provide assurance that by accepting and recognising third country licensing regimes we are not undermining the safety intent.

Outline of the proposed contents

It is not possible to foresee all circumstances in and conditions under which a requirement under subordinate legislation for spaceflight activities might be met by compliance with a prescribed requirement to give effect to an international agreement.

It is, however, anticipated that agreements with other countries may include the following matters, and these are the areas in which the provisions under this clause are likely to apply:

- Security, in terms of compliance with requirements set out in international agreements to which the UK is a party including restrictions under export controls;
- Safety, in terms of requirements for safety of equipment, storage of dangerous substances where there is likely to be some divergence but significant commonality between the regimes in different countries; and

- Training and qualifications, for example where there is likely to be similarity in the training requirements for individuals operating spacecraft, though not necessarily agreed international training standards, given the novelty of these vehicles.

It should be noted that it is intended that specific, individual requirements or prohibitions will be addressed, as opposed to any wholesale reliance on another country's requirements. Put simply, it is not intended that the regulator would rely on another country's licensing process and accept a licence granted elsewhere as equivalent to a licence granted in the UK in its entirety. This would be unacceptable in terms of ceding regulatory oversight and impractical for the simple reason that no extant regulatory regime in another country is sufficiently similar to that envisaged for the UK.

Clause 65: Use of records and documentary evidence

Clause 65(1) provides a power to make regulations to prescribe persons who can certify documents for the purpose of evidence in any legal proceedings and to prescribe a person or a person acting under the control of such a person who can make or produce a record of certain matters listed in (a) to (c) of subsection (3) that is to be considered as evidence in any legal proceedings. For this purpose "records" include a document or article purporting to be a copy of the record and certified as a true copy by the prescribed person or person acting under their control or on behalf of the prescribed person.

Outline of the policy intent

The purpose of this clause is to identify in regulations a person who may certify a document as a true copy of, or part of documents or records kept for the purposes of the Bill as evidence for use in legal proceedings.

The clause also provides for records to be evidence that have been made or produced as records by a person prescribed in regulations. Such records would purport to show the position of a spacecraft at any material time, messages or signals transmitted to or received from any spacecraft by that person or a person acting under that person's control.

This clause is based on a similar provision in section 96 of the Civil Aviation Act 1982. Regulations made under that section[18] designate the Civil Aviation Authority and the Secretary of State for certain purposes under section 96(1) of that Act.

Outline of the proposed content

It is proposed that the regulations will set out those persons who can certify a document as a true copy or that a document was part of a set of documents or records.

These persons are envisaged to be the Secretary of State, a regulator or appointed person or an employee or contractor of one of these people authorised to certify a document as above. This would include inspectors who have visited a spaceport and have collected documents or records that have been submitted in support of an application for a licence.

It is proposed that the regulations will also set out those persons who can make or produce records as evidence in relation to the position or signals transmitted by a spacecraft. These could include the Secretary of State, a regulator, the holder of a range control licence or an appointed person of one of these people or an employee or contractor authorised to certify a document as above.

[18] The Civil Aviation (Documentary Evidence) Regulations 1972 (S.I. 1972/187).

Clause 66: Minor and consequential amendments, including Schedule 12

Clause 66(2) provides a power to make regulations consequential on any provision made by this Bill.

Clause 66(3) provides a power to make regulations that amend, repeal or revoke any enactment passed or made before this Bill or in the same Session.

Schedule 12:

- Paragraph 4(2) amends the Aviation Security Act 1982 to provide a power for the Secretary of State to make an order that subsection (1A) of section 38 of that Act (a reference in that Act to an aircraft to include a reference to a medium-range rocket) does not apply to any specified provisions of that Act and for any provision of that Act, as it has effect by virtue of subsection (1A) to apply with specified modifications.
- Paragraph 7 amends the Airports Act 1986 to provide a power for the Secretary of State to make an order that subsection (1C) of section 82 of that Act (a reference in that Act to an aircraft to include a reference to a medium-range rocket) does not apply to any specified provisions of that Act and for any provision of that Act, as it has effect by virtue of subsection (1C) to apply with specified modifications.
- Paragraph 8 amends the Outer Space Act 1986 ("the 1986 Act") to provide a power for the Secretary of State to make an order providing for activities or persons to be exempted from the requirements of a licence by the Order itself or the Secretary of State if he or she is satisfied that the requirement is not necessary to secure compliance with the international obligations of the United Kingdom.
- Paragraph 9 amends the 1986 Act to provide a power to make regulations setting out a charging scheme.
- Paragraph 16 amends the Aviation and Maritime Security Act 1990 to provide a power for the Secretary of State to make an order that subsection (1) of section 48A of that Act (a reference in that Act to an aircraft to include a reference to a medium-range rocket) does not apply to any specified provisions of that Act and for any provision of that Act, as it has effect by virtue of subsection (1C) to apply with specified modifications
- Paragraph 17 amends the Airports (Northern Ireland) Order 1994 to provide a power for the Department of the Environment to make an order that paragraph (3A) of Article 2 of that Order (a reference in that Order to an aircraft to include a reference to a medium-range rocket) does not apply to any specified provisions of that Order and for any provision of that Order, as it has effect by virtue of paragraph (3A) to apply with specified modifications.
- Paragraph 20(2)(a) amends Section 93 of the Transport Act 2000 to provide that the power to give directions to a listed person in section 93 of that Act includes a person (other than the Civil Aviation Authority) appointed by regulations made under section 15 of the Space Industry Act.

Outline of the policy intent

The purpose of this clause is to give effect to the minor and consequential amendments contained in Schedule 12. These constitute amendments to the Land Registration Act (Northern Ireland) 1970, Magistrates Court Act 1980, Civil Aviation Act 1982, Aviation Security Act 1982, Criminal Justice Act

1982, Police and Criminal Evidence Act 1984, Airports Act 1986, Outer Space Act 1986, Aviation and Maritime Security Act 1990, Airports (Northern Ireland) Order 1995, Police Act 1997, Transport Act 2000, Criminal Justice Act 2003, Criminal Justice (Northern Ireland) Order 2004, Terrorism Act 2006, Armed Forces Act 2006, Counter-Terrorism Act 2008, Criminal Justice (Northern Ireland) Order 2008, Energy Act 2013 and Modern Slavery Act 2015.

Although these consequential changes have been identified, it is possible that other changes may be required and clause 66(2) and (3) confer a power for the Secretary of State to make such changes through secondary legislation.

Outline of the proposed content

Clause 66(2) and (3)

This power is needed to make any further minor and consequential amendments to other enactments passed before the Act or during the same Session that become apparent during the development of detailed secondary legislation.

Spaceflight is a complex activity and whilst related areas of law have been scrutinised it is impossible to rule out the possibility that some other rule of law might be engaged in the future. Equally, spaceflight or associated activities might need to be brought in scope of other laws, as the possibility of spaceflight activities from the UK would not have been contemplated when they were drafted.

Therefore the content of the regulations in relation to subsections (2) and (3) will only become known as the secondary legislation develops and further regulations may also be made in the future as and when they are required.

Schedule 12

Aviation Security Act 1982

Paragraph 4 amends the Aviation Security Act by providing that any reference in that Act to an aircraft includes a reference to a medium-range rocket (which is defined in the amendment to mean a rocket with a total impulse of its motors exceeding 160 Newton-seconds but which is not capable of operating above the stratosphere). A power is provided by the amendment for the Secretary of State to make an order that such a reference will not apply to any specified provisions of that Act or to provide for any provision of it, as it has effect by virtue of the amendment, to apply with specified modifications.

The purpose of this amendment and power is to enable that Act to be applied to medium-range rockets, with necessary modifications, and to disapply any specified provision of it to medium-range rockets where it would be inappropriate for such a provision to apply to such rockets.

At this time it is not known if and how the power to make such an order will be exercised and further work will be required to establish this.

Airports Act 1986

Paragraph 7 amends the Airports Act by providing that any reference in that Act to an aircraft includes a reference to a medium-range rocket (which is defined in the amendment to mean a rocket with a total impulse of its motors exceeding 160 Newton-seconds but which is not capable of operating above the stratosphere). A power is provided by the amendment for the Secretary of State to make an order that such a reference will not apply to any specified provisions of that Act or to provide for any provision of it, as it has effect by virtue of the amendment, to apply with specified modifications.

The purpose of this amendment and power is to enable that Act to be applied to medium-range rockets, with necessary modifications, and to disapply any specified provision of it to medium-range rockets where it would be inappropriate for such a provision to apply to such rockets.

At this time it is not known if and how the power to make such an order will be exercised and further work will be required to establish this.

Outer Space Act 1986

Paragraph 8 of this Schedule amends the 1986 Act in order to enable an exemption from licensing along the lines of the exemption available under the Bill at clause 4(2). As set out in the note for clause 4, as the technology in the space sector develops there may be activities that require licensing but it would be burdensome on industry to require a licence. This amendment brings the exemption in the 1986 Act in line with the Bill. Procedural provisions in relation to the exemption can be made in the order.

The original provision in the 1986 Act for making an order was subject to the negative resolution procedure but in order to be consistent with the equivalent provision in the Act, it is considered that the affirmative procedure provides the appropriate level of Parliamentary scrutiny.

Paragraph 9 of Schedule 12 removes section 4(3)(d) of the 1986 Act and replaces it with a new section outlined in paragraph 10. Currently, section 4(3)(d) of the 1986 Act, provides that the Secretary of State may make regulations requiring the payment of such fees as may be prescribed. This will be replaced with a new section 4A which provides that the Secretary of State may make charging schemes in regulations in respect of the functions performed by the Secretary of State under the Bill.

The rest of paragraph 10 makes provisions relating to the charging schemes.

The purpose of these amendments is to ensure that the same charging regime applies to both licences for space activity issued under the 1986 Act and the Bill to ensure consistency.

The content of the regulations for charging schemes for licences issued under the 1986 Act will be based on the same principles for charging as those outlined in relation to clause 61 and Schedule 11.

Aviation and Maritime Security Act 1990

Paragraph 16 amends the Aviation and Maritime Security Act by providing that any reference in that Act to an aircraft includes a reference to a medium-range rocket (which is defined in the amendment

to mean a rocket with a total impulse of its motors exceeding 160 Newton-seconds but which is not capable of operating above the stratosphere). A power is provided by the amendment for the Secretary of State to make an order that such a reference will not apply to any specified provisions of that Act or to provide for any provision of it, as it has effect by virtue of the amendment, to apply with specified modifications.

The purpose of this amendment and power is to enable that Act to be applied to medium-range rockets, with necessary modifications, and to disapply any specified provision of it to medium-range rockets where it would be inappropriate for such a provision to apply to such rockets.

At this time it is not known if and how the power to make such an order will be exercised and further work will be required to establish this.

Airports (Northern Ireland) Order 1994

Paragraph 17 amends the Airports (Northern Ireland) Order 1994 by providing that any reference in that Order to an aircraft includes a reference to a medium-range rocket (which is defined in the amendment to mean a rocket with a total impulse of its motors exceeding 160 Newton-seconds but which is not capable of operating above the stratosphere). A power is provided by the amendment for the Department of the Environment (now the Department for the Environment, Farming and Rural Affairs) to make an order that such a reference will not apply to any specified provisions of that Order or to provide for any provision of it, as it has effect by virtue of the amendment, to apply with specified modifications.

The purpose of this amendment and power is to enable that Order to be applied to medium-range rockets, with necessary modifications, and to disapply any specified provision of it to medium-range rockets where it would be inappropriate for such a provision to apply to such rockets.

At this time it is not known if and how the power to make such an order will be exercised and further work will be required to establish this.

Transport Act 2000

Paragraph 20(2)(a) amends section 93 of the Transport Act 2000 to provide that the power to give directions to a listed person mentioned in section 93 of that Act includes a person (other than the CAA) appointed by regulations made under clause 15 of the Space Industry Bill. The exercise of this power will depend on which person (other than the CAA) is appointed under regulations made under that section.

Clause 67: Regulations: general

Clause 67(1) provides that regulations may make provision generally for carrying the Bill into effect and for achieving the purpose set out in subsection 1(1).

Clause 67(2) provides that the power to make regulations or an order may be exercised for all cases, with specified exceptions or for any specified cases or descriptions of case so as to enable such powers to be exercised flexibly. In addition the power may be exercised so as to allow exceptions to the provision, for different provision to be made for different cases and for the provision to be subject to conditions.

Clause 67(3) provides that regulations under the Bill may make:

- different provision for different areas;
- provision applying to conduct or places outside the United Kingdom; or
- supplemental, incidental, transitional or consequential provision (including provision about licences under the Outer Space Act 1986 and applications for them).

Clause 67(7) provides that any provision that under the Bill may be included in regulations may be included in an Air Navigation Order except for clause 66(4) (amendments to primary legislation), clause 67(6) to (8) of this section (Parliamentary procedure for making statutory instruments including an Air Navigation Order) or clause 69 (Commencement regulations).

In summary, the purpose of these subsections is to enable the regulations to be made under the Bill to be as flexible as possible in their application to different cases for which the regulations are made, to contain exceptions to general requirements imposed under regulations, to enable regulations to apply outside the UK, to contain supplemental, transitional and saving provisions and to enable regulatory requirements relating to sub-orbital spacecraft to be made in an Air Navigation Order.

Outline of the policy intent

The Bill provides powers in different sections to make regulations for specific purposes for regulating spaceflight and associated activities, such as safety or security. Whilst it is envisaged that such powers will be sufficient to provide the necessary regulatory framework in the secondary legislation, there remains the possibility that due to the emerging nature of the technology an aspect of such regulation may have been overlooked in those sections. The power to make regulations under subsection (1) would therefore only be used where this was the case. Regulations under this subsection are subject to annulment by a resolution of either House of Parliament apart from any statutory instrument mentioned in subsection (6) or an instrument containing regulations made under clause 66(4) or clause 69.

Subsection (2) is to enable regulations to have sufficient flexibility to contain exceptions to a general rule, for example a spacecraft pilot might be required to hold a certain type of pilot licence but there might be an exception for a military pilot who might otherwise be sufficiently qualified to so act but not necessarily hold such a licence. In addition, this subsection enables regulations to make different provision for different cases or subject to different conditions, again enabling the regulations to be flexible when addressing the requirements for different types of spaceflight operation and activities.

Subsection (3) enables regulations to make different provision for different areas, reflecting the fact that there will be different types of spaceflight operations for which different provision may be needed. Some of the regulations (e.g. safety requirements during operation of a spacecraft) will need to apply to conduct or places outside territory of the UK. The regulations will also need to contain provisions supplemental, incidental or consequential to the express provisions mentioned in the regulation-making sections of the Bill.

Subsection (7) is to enable provisions that may be made in regulations relating to sub-orbital spaceflight activities to be made in an Air Navigation Order, reflecting the view that spacecraft undertaking such activities may be regarded as a form of aircraft when operating in certain phases of flight (i.e. when gliding without rocket power).

Outline of the proposed content

It is not currently proposed to exercise the powers under subsection (1) for the reasons mentioned above. It is, however, anticipated that it may be necessary to make provision in relation to environmental requirements relating to noise and emissions under this power.

It is proposed that powers under subsection (2) will be used to enable regulations to have sufficient flexibility to contain exceptions to a general rule, exceptions to general requirements may be provided for in regulations but each one will be carefully considered in terms of public safety. In addition, this subsection will enable regulations to make different provision for different cases or subject to different conditions (e.g. when addressing the requirements for different types of spaceflight operation and activities). The need for different provisions for different cases or descriptions of cases will be carefully considered during the development of the regulations to be made under the Bill.

Identification of supplemental, incidental or consequential provisions will depend on the nature of the substantive provisions to which they will relate but for, example, regulations requiring the production of documents or record under clause 25 (Monitoring and enforcement by regulator) may require they be produced within a certain time and in a certain form.

Transitional and consequential provisions will be necessary in relation to existing licensees and applications for licences under the Outer Space Act 1986 prior to the coming into force of the Bill so that it is clear what is expected in each case.

Subsection (3)(b) will be used to make regulations providing for different provision for different areas (e.g. with regard to the different types of spaceflight operations for which different provision may be needed). Some of the regulations (e.g. safety requirement applying on board a spacecraft) will need to continue to apply to spacecraft when they are outside UK airspace.

Certain regulations may be made under an Air Navigation Order rather than by regulations made under this Bill. This may be more convenient for readers when there is an overlap of powers contained in aviation legislation and those contained in this Bill. For instance, horizontal launch spaceports will also be aerodromes subject to aviation legislation.

Similarly, carrier aircraft will continue to be regulated under aviation law. This Bill also does not preclude sub-orbital spacecraft that have design features of aircraft from being regulated under

aviation laws. Thus, for instance, the CAA might consider in any particular case whether an exemption from aviation legal requirements ought to be granted to ensure additional legal certainty. Alternatively an exemption might be granted under this Bill, if a sub-orbital spaceplane is ever certified to full airworthiness standards to carry passengers for international transport purposes.

Clause 69: Commencement

Clause 69(2) enables the Secretary of State to make regulations to appoint commencement days for the various sections of the Bill and for such regulations to make transitional, transitory or saving provision.

Outline of the policy intent

With the exception of clauses 67 to 71 which will automatically come into force on the day that the Bill is enacted as law, this clause enables the Secretary of State to make regulations to bring into force the provisions in this Bill on certain days. The Bill allows for different provisions to be brought into force on different days and to also make transitional, transitory or savings provisions.

Outline of the proposed content

The Outer Space Act 1986 ("the 1986 Act") currently regulates UK nationals who engage in space activities (procurement of an overseas launch and the operation of a satellite in orbit). When it comes into force, the Bill will regulate activities that are carried out the UK, whilst the 1986 Act will be amended to regulate activities that are carried out overseas by UK nationals.

These regulation making powers will therefore be used to ensure that any transitional process for those activities that are currently regulated under the 1986 Act, which will move to be regulated by this Bill, are done so in a smooth and effective way.

It is proposed that, subject to consultation and parliamentary timetable, regulations which regulate spaceflight activities will be laid in summer 2019.

For this purpose the sections of the Bill conferring regulation making or order making powers will be brought into force first along with those sections that create offences, namely clauses 3(5), 4(2) and (4), 5(2), 6(1)(g), 7(4) and (6), 8(5), (6) and (7), 9(2), (5) and (6), 10(b), 12(3) and (7), 15(1), 16(3), 17(1), (4) and (5) and Schedule 2, 18(1) and Schedule 3, 19(1) and (2), 22(1) and Schedule 5, 25(3), 33(5) and (6), 34(5), 37(1) and (2), 51(1), 53(1), (2), (3) and (5), 55(4), 58(2), 59 and Schedule 10, 61 and Schedule 11, 64(1) and 67.

Approach to preparation and timing

It is intended that commencement orders for the clauses specified will be made immediately after Royal Assent of the Bill to allow for consultation and drafting of Statutory Instruments to proceed. These will be specifically focused to bring into force those first those provision that enable effective operation from the UK (e.g. spaceport licences and land provisions).

Glossary

ALARP = As low as reasonably practicable

CAA = Civil Aviation Authority

COMAH = Control of Major Accident Hazards Regulations

DfT = Department for Transport

EASA = European Aviation Safety Agency

FAA = Federal Aviation Administration

ICAO = International Civil Aviation Organisation

MAA = Military Aviation Authority

MoD = Ministry of Defence

MoU = Memorandum of understanding

MPL = Maximum probable loss

TPL = Third party liability

UKSA = UK Space Agency