Department for Transport

Department for Business, Energy & Industrial Strategy

Civil Aviation Authority

UK SPACE AGENCY

UNLOCKING COMMERCIAL SPACEFLIGHT FOR THE UK

Consultation on draft regulations to implement the Space Industry Act 2018

Closing date: 21 October 2020

Any enquiries regarding this publication should be sent to us at: SpaceTeam@dft.gov.uk

Contents

Executive Summary

Introduction

The draft regulations to support the Space Industry Act 2018 will enable a range of commercial spaceflight and associated activities to operate within the UK, creating the conditions for horizontal and vertical launch to take place from UK spaceports.

The Space Industry Act 2018 created the high-level legal framework to enable commercial spaceflight and associated activities to be carried out from the UK. The Act, which received Royal Assent on 15 March 2018, contains delegated powers to make secondary legislation. The draft Space Industry Regulations, together with draft instruments covering Accident Investigation and Appeals, will implement the Act.

Currently the space activities of UK entities are governed by the Outer Space Act 1986. This requires any UK entities who procure the launch of a satellite and/or operate a satellite in orbit to hold a licence. The UK has a well-established and globally respected licensing regime for these activities.

Whilst the Space Industry Act 2018 is now law, the draft secondary legislation contained in this consultation is required to create the regulatory framework necessary for commercial launch operations to be licensed in the UK.

Once in force, the Space Industry Act 2018 will work alongside the Outer Space Act 1986 to regulate the spaceflight and associated activities of UK entities.

The Outer Space Act 1986 will continue to regulate the following activities carried out overseas by UK entities:

- The procurement of the overseas launch of a space object;
- The operation of a satellite in orbit from an overseas facility by a UK entity.

The Space Industry Act 2018 will regulate the following activities carried out from the UK:

- Launch (space or sub-orbital) and return;
- The procurement of a UK launch (space or sub-orbital);
- The operation of a satellite in orbit;
- The operation of a spaceport;
- The provision of range control services.

The draft regulations to support the Space Industry Act 2018 are a result of a collaboration across Government, building on existing space and aviation legislation and harnessing a range of regulatory, technical and legal expertise. The Department for Business, Energy and Industrial Strategy; the Department for Transport; the UK Space Agency and the Civil Aviation Authority have worked closely together, with the support of the Health and Safety Executive, to develop these regulations.

The regulations are accompanied by a series of guidance documents. These guidance documents – aimed at applicants and licensees intending to carry out spaceflight activities, to operate a spaceport or to provide range control services – will help industry to understand the requirements and comply with the Space Industry Act 2018 and the regulations made under it.

We are keen to understand that the legal text has achieved a balanced and proportionate set of regulations and expect respondents to fully read and comprehend the regulations and associated impact assessment rather than relying on the guidance alone to understand the meaning behind the legal text. Respondents should, however, note that the documents and regulations presented as part of this consultation are drafts and are therefore subject to further refinement. The regulator is also actively considering what further materials could be published alongside these guidance documents in the future.

It is our intention to publish a further consultation at a later date to seek views on the proposed approach of Her Majesty's Government (HMG) relating to insurance requirements under section 38 of the Space Industry Act 2018.

To ensure that these services are carried out safely and responsibly, we are creating a new regulator for commercial spaceflight and associated activities. It is our intention that the Civil Aviation Authority will undertake all Space Industry Act 2018 regulatory functions in addition to regulating in-orbit activities under the Outer Space Act 1986.

Why we are consulting

The Secretary of State is required by section 68(7) of the Space Industry Act 2018 to carry out a public consultation before making regulations to which section 68(6) of the Act applies.

This consultation also covers regulations to which section 68(6) does not apply. The intent behind including these in this consultation is to ensure transparency and appropriate context for respondents.

This consultation seeks views on the operability and effectiveness of the draft Space Industry Regulations; Accident Investigation Regulations; Appeals Regulations; and the associated guidance documents and Regulator's Licensing Rules. This consultation also aims to gather new evidence and test the assumptions in the consultation stage impact assessment.

To facilitate consideration of the proposals, pre-consultation engagement has been carried out with key stakeholders. We have held a series of plenary events with industry in the run-up to the consultation. In addition, officials have discussed the draft regulations and guidance with the Non-Governmental Organisation community and the devolved administrations. This is in addition to a Call for Evidence that we published in March 2018.

This consultation document describes and explains what we are trying to achieve with the draft regulations and sets out our key questions. All questions are then additionally set out in a catalogue at the back of this document.

Responses to this consultation will be taken into account when taking the policy forward and the draft regulations and associated guidance documents may be further revised.

How to respond

For ease of reference, questions posed throughout the document are also listed together in a catalogue of questions at the back of this document.

Your response will be most useful if it is framed in direct response to the questions posed, though further comments and evidence are also welcome. When responding, please state whether you are responding as an individual or representing the views of an organisation. You are encouraged to respond by completing an online survey at:

https://www.smartsurvey.co.uk/s/34H0P0/

Alternatively, you can email your responses to SpaceTeam@dft.gov.uk

Hard copies can also be submitted to the address below and should be clearly marked 'Space Industry Consultation'.

Issued: 29 July 2020

Respond by: 21 October 2020

Territorial extent:

The draft regulations contained in this consultation will extend to the whole of the UK – England and Wales, Scotland and Northern Ireland. Accordingly, we welcome the views of the Devolved Administrations.

Enquiries to:

Commercial Spaceflight Policy Team, Department for Transport, Great Minster House, 33 Horseferry Road, London, SW1P 4DR.

Tel: 0300 330 3000 Email: SpaceTeam@dft.gov.uk

Consultation reference: Consultation on Draft Space Industry Regulations

Additional copies:

You may make copies of this document without seeking permission. An electronic version can be found at:

https://www.gov.uk/dft#consultations

Hard copies can be provided upon request either from the postal address given above, or by emailing:

SpaceTeam@dft.gov.uk

A range of accessible format versions of the consultation documents can be provided in response to specific requests – please get in touch so that we can make appropriate arrangements.

Confidentiality and data protection

Information you provide in response to this consultation, including personal information, may be disclosed in accordance with UK legislation (the Freedom of Information Act 2000, the Data Protection Act 2018 and the Environmental Information Regulations 2004).

If you want the information that you provide to be treated as confidential please tell us, but be aware that we cannot guarantee confidentiality in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not be regarded by us as a confidentiality request.

We will process your personal data in accordance with all applicable UK and EU data protection laws. See our privacy policy.

We will summarise all responses and publish this summary on GOV.UK.

Quality assurance

This consultation has been carried out in accordance with the government's consultation principles.

If you have any complaints about the way this consultation has been conducted, please contact:

Consultation Co-ordinator
Department for Transport Zone 1/29
Great Minster House London SW1P 4DR

Or email: consultation@dft.gsi.gov.uk

Context and Background Information

The future of spaceflight in the UK

The UK's space sector can strengthen our national capabilities, create high-skilled jobs and drive future economic growth across the UK. To support this, the Queen's Speech on 19 December set out the Government's intent to establish a new National Space Council and develop a comprehensive UK Space Strategy. The launch of this consultation and the introduction of this new regulatory framework form an important part of the work we are doing to enhance the UK's national approach to space by bringing commercial spaceflight to the UK and creating a supportive regulatory environment which fosters growth in the sector.

Government and industry have set a target to grow the UK's share of the global market to 10 per cent by 2030. In order to support this, our spaceflight programme aims to establish commercial vertical and horizontal small satellite launch from UK spaceports. To help expand the UK's spaceflight capabilities, government is funding a range of industry-led projects. Separately, we are also investing in related facilities and technology. This will provide industry with new commercial market opportunities, grow our export share and help to build new UK supply chains.

As acknowledged in the Government's Research and Development Roadmap[1], regulation that enables the development, demonstration and deployment of new technologies is essential to championing companies on the technological frontier. Our regulatory framework for spaceflight will support safe and sustainable activities that will drive research, innovation and entrepreneurship in this vital sector, exploiting the unique environment of space, and providing a catalyst for growth across the space sector. This will feed into our emerging National Space Strategy as we develop further priorities for the UK and the sector in the long term.

The UK already has an internationally respected licensing regime for activities in space. Now our aim is to license launches from UK spaceports. The Space Industry Act 2018 created the high-level framework to enable commercial spaceflight and associated activities to be carried out from the UK. This piece of primary legislation, which received Royal Assent on 15 March 2018, contained delegated powers to make secondary legislation.

The draft secondary legislation contained in this consultation is the result of collaboration between the Department for Business, Energy and Industrial Strategy; the Department for Transport; the UK Space Agency; and the Civil Aviation Authority, with the support of the Health and Safety Executive.

We have legislated to allow for the regulation of a wide range of new commercial spaceflight technologies, including traditional vertically launched vehicles, air-launched vehicles and sub-orbital spaceplanes and balloons. We have endeavoured to produce legislation that is flexible enough to accommodate emerging technological advancements, market opportunities and changes to the international legal landscape, while keeping safety at the forefront.

1 https://www.gov.uk/government/publications/uk-research-and-development-roadmap

The Outer Space Act 1986

Currently the space activities of UK entities are governed by the Outer Space Act 1986. This requires UK entities who procure an overseas launch and/or operate a satellite in orbit to hold a licence. The UK has a well-established and globally respected licensing regime for these activities.

Once in force, the Space Industry Act 2018 will work alongside the Outer Space Act 1986 and will regulate spaceflight and associated activities in the UK.

The Outer Space Act 1986 will continue to regulate activities carried out overseas by UK entities:

- The procurement of the overseas launch of a space object;
- The operation of a satellite in orbit from an overseas facility by a UK entity.

The Space Industry Act 2018

The Space Industry Act 2018 is a major step towards establishing a safe and supportive regulatory framework to enable launches to take place from the UK from the early 2020s. This piece of primary legislation sets out a high-level enabling framework for commercial spaceflight operations. The draft secondary legislation contained in this consultation provides the detailed regulations required to implement the Act.

Once in force, the Space Industry Act 2018 will regulate and support activities carried out from the UK, including:

- Launch (space or sub-orbital) and return;
- The procurement of a UK launch (space or sub-orbital);
- The operation of a satellite in orbit;
- The operation of a spaceport;
- The provision of range control services.

Once in force, the Space Industry Act 2018 will regulate activities carried out from the UK. This includes launching a rocket outside of UK airspace from a carrier aircraft that took off from a UK spaceport. As this type of operation is intended to send a satellite into orbit, under the Act the whole operation will be licensed as a “space activity”. Another example of activities regulated under the Act is the launching of a launch vehicle from a United Kingdom ship in UK territorial waters where the launch vehicle was loaded onto the ship from a UK port. Any site that meets the description of a spaceport set out in Section 3(2) of the Act will need to meet the spaceport requirements contained in the Act as well as the regulations made under it.

This consultation seeks views on the operability and effectiveness of the draft Space Industry Regulations; Accident Investigation Regulations; Appeals Regulations; and the associated guidance documents and Regulator’s Licensing Rules.

As part of this consultation, a consultation stage Impact Assessment has also been published. This consultation aims to gather new evidence and test the assumptions in that assessment.

It is our intention to publish a further consultation at a later date to seek views on the proposed approach of Her Majesty's Government (HMG) relating to insurance requirements under section 38 of the Space Industry Act 2018.

The Government may publish its response to both of these consultations together.

Work is ongoing with regard to assessing the merits of limiting the liability to indemnify Government and the liability to the uninvolved general public for launch activities taking place from the UK. As per the Government response to the call for evidence issued in May 2019, the Government has commissioned further detailed and independent research, by way of a report, to inform this decision.

The report has been received and we are in the process of considering the contents and our next steps. We intend to re-engage with industry on this issue when we have a policy position. It is important to note, however, that if the Government considers that a limit on liabilities is justified, the Government would then need to assess any financial, state subsidies and other legal implications before finalising its position on liability limits.

Section 11 (Grant of licences: assessment of environmental effects) of the Space Industry Act 2018 stipulates the requirement that an applicant must submit an assessment of environmental effects (AEE) before the regulator can grant a spaceport licence or an operator licence authorising launches of spacecraft or carrier aircraft. In addition, applicants will also have to comply with any other existing environmental and planning regulatory requirements that may apply – such as marine licensing and planning permission. There are no powers to draft secondary legislation under section 11. Statutory guidance has been drafted to support applicants in the production of an AEE by providing advice on what an AEE is, what the regulator expects it to include and the process of submission. This draft is available as part of the package of guidance documents published as part of this consultation.

Section 11(4) of the Act provides a power for the regulator to direct that the requirement to provide an AEE be met, or met in part, by an equivalent assessment previously prepared in compliance with another statutory requirement or one prepared in respect of an earlier application. This is likely to be the case for most spaceport AEEs (excluding mobile spaceports) which have been through the planning process and may, at least in part, be able to use their planning Environmental Impact Assessment (EIA). This can only be done providing there has been no material change in circumstances since the previous assessment i.e. when the EIA was prepared. The purpose of this power is to avoid any duplication of effort for both the applicant and the regulator.

Question

In answering these questions, please also refer to the guidance material relating to the regulations.

1. Do you have any comments on our approach to assessment of environmental effects? Please provide details.

No additional legislation has been drafted for orbital operations under section 9 (risk) or section 19(1)(b) (safety). We intend to regulate orbital safety through licence conditions and accompanying guidance. The intended approach is similar to our current licensing regime under the Outer Space Act 1986. Orbital activities are characterised by a wide diversity of mission profiles and technologies used. An adaptable, outcomes-based regulatory regime is therefore important to ensure that new developments in recognised standards and practices

can be taken into account and that safety and security requirements can best target the specific concerns associated with a given activity.

We are considering using a Traffic Light System (TLS) of pre-application engagement for orbital operator licences. This will be an optional pre-application process through which prospective applicants provide the regulator with responses to a short set of questions about their business and the proposed spaceflight activities. The proposed TLS draws from the existing processes under the Outer Space Act 1986 but due to the more structured nature of the Space Industry Act 2018, there are some key differences we would see under a TLS developed from the Space Industry Act 2018.

Under the Act the regulator has an overriding duty to exercise its functions with regard to spaceflight activities (including whether or not to grant a licence) with a view to securing public safety. The Regulations made under the Space Industry Act 2018 (see regulations 20-27) prescribe the process which is to be followed in respect of applications for all licence types and the Regulator's Licensing Rules set out the information that is to be provided by applicants with their application form (see Table A and Table D for the information required in respect of orbital licence applications). Given the differences between the old and the new regime, a different approach is justified to the TLS.

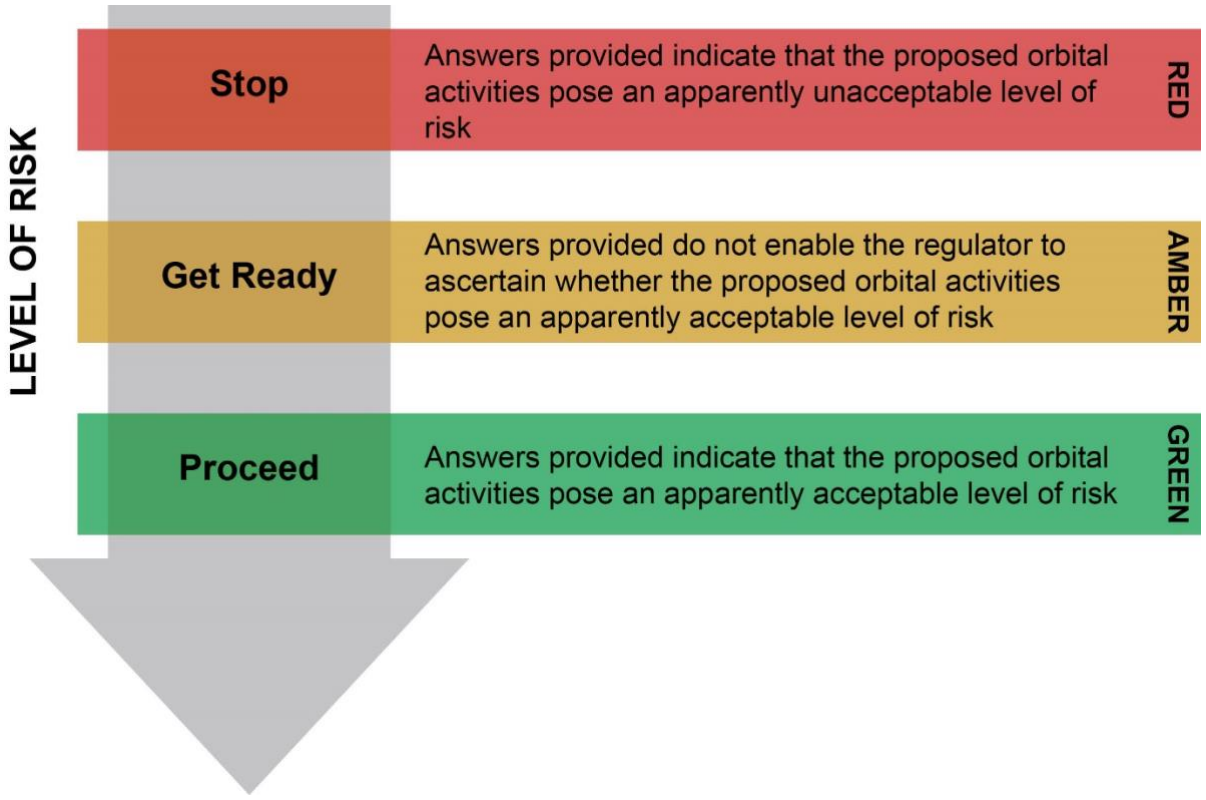
As under the Outer Space Act 1986, the TLS would not be a formal part of the application process. Rather, it would be an optional pre-application process which would allow prospective applicants to provide the regulator with responses to a short set of questions about their business and the proposed spaceflight activities. Based on those answers, the regulator would give prospective licence applicants a pre-application Red/Amber/Green rating.

The purpose of the proposed TLS is threefold:

- to help less experienced operators understand the need for safety, security, and sustainability, as reflected in the regulator's licensing process
- to help operators understand their readiness to apply and the barriers they may face
- where possible, to provide a smoother, more tailored application process

Our intention is that the ratings would provide an early, non-binding and approximate indication of the potential level of risk to safety, security and sustainability of the proposed orbital activity. The rating given would be based on the answers provided to the initial questions, and would not take account of any additional information which will be required by the regulator, e.g. under the Regulator's Licensing Rules, or further information required or requirements which must be met under the Regulations. If a prospective applicant does not meet those requirements when making its formal application, it is unlikely that a licence will be granted, even if it receives a "green" assessment:

- A 'green' rating means that the proposed orbital activities pose an apparently acceptable level of risk to safety, security and sustainability.
- An 'amber' rating means that the proposed orbital activities pose an uncertain level of risk to safety, security and sustainability
- A 'red' rating means that the proposed orbital activities pose an apparently unacceptable level of risk to safety, security and sustainability



Prospective applicants would not be obliged to use the TLS and would be able to submit an application for an orbital operator licence under the Act without having first received a Traffic Light rating. However, we foresee that new operators, and all operators hoping to launch new types of missions, would benefit from making use of the TLS to facilitate a smooth process when they make a formal application for an orbital operator licence.

Prospective applicants must note that any guidance they receive from the regulator before they submit a licence application will **not** form part of the regulator's decision-making process relating to granting or refusing the application for the licence. Nor do we intend for the red, amber or green rating to indicate the likely determination the regulator will make in respect of an application once submitted. The aim of any informal guidance pre-application is to facilitate the preparation of the application and of information required to be submitted in connection with the application. The process for obtaining a licence starts at the point when the regulator receives the application and the information in connection with it (see regulation 20 and the Regulator's Licensing Rules). The regulator will only begin to consider an application once it has received all necessary documentation.

At this stage, we are proposing to offer a TLS only for applicants for orbital operator licences. This is because:

- There is a wider diversity of missions conceivable and technologies used in the orbital context. Accordingly, there is a greater range of risk profiles for orbital activities than for activities covered by other licence types.
- Since 2018, the UK Space Agency has been using a Traffic Light System for applications under the Outer Space Act 1986, which regulates the operation of satellites or the procurement of a satellite launch from an overseas launch service. The UK Space Agency has experience in successfully using a Traffic Light System for activities that would be covered by an orbital operator licence under the Space Industry Act 2018.

Question

2. Would you welcome a Traffic Light System for orbital operator licence applications under the Space Industry Act 2018?

3. Do you have any comments on the proposed Traffic Light System? Please provide details.

4. Do you have any comments on our approach to orbital activities? Please provide details.

No additional legislation has been drafted under section 65 (Agreements with other countries: compliance with requirements etc) as it is considered that implementation of the United Kingdom's international obligations, such as those included in the technology safeguards agreement negotiated with the United States (see International context), is best done via regulations made under specific powers under the Space Industry Act 2018 other than under section 65 of the Act.

No additional legislation has been drafted regarding Point A to Point B sub-orbital spaceflight operations and orbital and interstellar spaceflight operations with human occupants. We do not currently intend to license these activities. These are technically complex and difficult to regulate activities, and by their very nature will require global collaboration on common standards to a much higher threshold than is achievable with current technologies.

At this time we are not producing draft regulations under section 62 of the Act relating to charging in respect of the performance of functions conferred on the Secretary of State. We intend to re-engage with industry on this issue when an HMG position on charging has been agreed. The regulator may consult on a scheme in accordance with Schedule 11 (Charging Schemes) of the Act in respect of the performance of functions conferred on the regulator.

Section 52 of the Act allows for regulations to be made relating to offences that occur on board a spacecraft. This power has not been exercised because it is not considered necessary at this stage to create the detailed new offences envisaged by section 52. Furthermore, the offences in the Act and new offences to be created by way of regulations is deemed to be sufficient at this juncture for the type of spaceflight activities to be carried out. HMG will keep this matter under review and will take steps to exercise the power when required in future.

Pre-consultation engagement

To facilitate consideration of the proposals and gather further evidence, pre-consultation engagement has been carried out with key stakeholders. We have held a series of plenary events with industry in the run-up to the consultation, including events communicating the intent behind the legislation and explaining the consultation process. In addition, officials have discussed the draft regulations and guidance with the Non-Governmental Organisation community and the devolved administrations.

This is in addition to a Call for Evidence that we published in March 2018 to inform further policy development of the Space Industry Act 2018 provisions on liability, insurance and charging. The Government response to this Call for Evidence can be viewed here: https://www.gov.uk/government/publications/call-for-evidence-space-industry-act-2018

Structure of the instruments and guidance

The secondary legislation implementing the Space Industry Act 2018 will be split into several statutory instruments:

- The Space Industry Regulations (covering licensing, compliance, monitoring, safety and security)
- The Spaceflight Activities (Investigation of Spaceflight Accidents) Regulations (made under section 20 of the Act)
- The Space Industry (Appeals) Regulations (made under section 60 of the Act)
- Commencement regulations (made under section 70 and commencing some of the provisions of the Act that were not previously commenced by 2018 Commencement regulations[2])

Commencement regulations are statutory instruments made to bring into force the whole or part of an Act of Parliament and are not generally subject to Parliamentary procedure, therefore we are not consulting on these. Commencement regulations do not place any requirements or burdens on industry, and spaceflight activities under the Space Industry Act 2018 cannot commence until the supporting Regulations have been laid in and approved by both Houses of Parliament. Their purpose is to bring provisions in the Act into force.

The Commencement regulations may include transitional provisions to govern applications made under the Outer Space Act 1986 that are being processed when the Space Industry Act 2018 comes into force. The intention is that such applications continue to progress under the Outer Space Act 1986. Existing Outer Space Act 1986 licences will continue in force subject to the provisions of the Outer Space Act 1986 and no further licence will be required under the Space Industry Act 2018. Also, as a temporary measure, the Commencement regulations will be used to commence certain key provisions of the Space Industry Act 2018 partially. The effect of such partial commencement would be to ensure that:

- the licensing of space activities involving an orbital launch vehicle with human occupants will not initially be possible
- the licensing of spaceflight activities involving hypersonic (or any other experimental) transport from A to B will not initially be possible;
- the licensing of a procurement of an overseas launch carried out under the Outer Space Act 1986 continues to be done under that Act.

In addition, the draft Regulator's Licensing Rules have also been published as part of this consultation. The rationale behind publishing these drafts together is to ensure that the Regulator's Licensing Rules are read in conjunction with the guidance documents that relate to the requirements for applying for a licence (in particular, the 'Guidance for applying for a licence under the Space Industry Act 2018 (for all licence applicants)' and the guidance documents specified for each licensable activity under the Act). This is because the Regulator's Licensing Rules pertain to matters specified under section 8(6)(a)-(d) of the Act relating to applications for a licence (i.e. the form and contents of an application, information to be provided in connection with an application, procedure for rectifying procedural irregularities

2 https://www.legislation.gov.uk/uksi/2018/1224/regulation/2/made

and time limits). We welcome views on all aspects of the Regulator's Licensing Rules and are particularly interested in feedback on the following areas:

- Information to be provided in connection with an application form. Where appropriate, in formulating the lists of information in the tables in the Regulator's Licensing Rules we have considered the existing information requirements that applicants must comply with when submitting an application for a licence under the Outer Space Act 1986. Your views regarding the feasibility of the information requirements in the tables in the Regulator's Licensing Rules would be very welcome.
- Time limits for doing anything required to be done in connection with an application and the procedure for extending any period so prescribed. This section of the Regulator's Licensing Rules is still in development and subject to change in conjunction with emerging regulatory processes. Therefore, views on any potential amendments and additions to this section are welcome.

Question

5. Do you have any comments on the Regulator's Licensing Rules?

The following documents have been drafted for publication as part of this consultation. We welcome comments on these drafts:

- The Regulator's Licensing Rules
- Principles and guidelines for the spaceflight regulator in assessing ALARP and acceptable risk
- Applying for a licence under the Space Industry Act 2018
- Guidance for launch operator and return operator licence applicants and licensees
- Guidance for spaceport licence applicants and licensees
- Guidance for range control licence applicants and licensees
- Guidance for orbital operator licence applicants and licensees
- Guidance for the assessment of environmental effects
- Guidance on security matters for applicants and licensees
- Guidance on the investigation of spaceflight accidents
- Guidance on appealing decisions made under the Space Industry Act 2018
- Guidance on liabilities under the Space Industry Act 2018
- Guidance on duties for all licensees under the Space Industry Act 2018 including monitoring and enforcement by the regulator

The regulator

Successive governments have followed a policy of separating safety regulation from sector promotion to ensure regulation is impartial. On these principles it is our intention that the Civil Aviation Authority will undertake all Space Industry Act 2018 regulatory functions in addition to regulating in-orbit activities under the Outer Space Act 1986. With regard to the Space Industry Act 2018, the functions are conferred on the Civil Aviation Authority by draft regulations contained in this consultation made under section 16 of the Space Industry Act 2018. It is our intention to produce further regulations delegating certain functions of the Secretary of State under the Outer Space Act 1986 to the Civil Aviation Authority.

Safety and the ALARP principle

Safety is at the heart of our proposed regulatory regime. Launch from the UK is a new activity that presents new and different risks from those posed by traditional aviation and our experience of licensing procurement of launch activities from other states under the Outer Space Act 1986.

The draft regulations under the Space Industry Act 2018 are proportionate and outcome focused and are not a set of detailed prescriptive operating requirements. Outcome based regulation drives a more holistic consideration of safety, while supporting innovation and new entrants to the market. This is in keeping with the goal setting approach set out in the Health and Safety at Work etc. Act 1974[3]. In some instances, the guidance documents may suggest approaches that may be taken to meet the requirements set out in the regulations. Alternative approaches may be acceptable, but only where it is demonstrated to the regulator that risk is managed to the required standard of being as low as reasonably practicable.

These draft regulations are informed by the UK's current regulatory framework for civil aviation and best practice championed by the Health and Safety Executive, as used across other high-risk industries in the UK such as oil and gas and nuclear.

We have also looked at international examples from countries that have more experience with launch activities, for example the United States. The Federal Aviation Administration – Office of Commercial Space Transportation (FAA-AST) has a wealth of existing regulation[4] which we have sought to learn from. However, the US has a long history of state-led launch activities, out of which their regulatory framework has developed. Launch is new to the UK, and we have the opportunity to create a new regulatory framework that allows for technological developments and a range of activities predominantly from the commercial sector.

An important consideration for the regulator is how licence applicants will be asked to demonstrate that the risks their activities pose to the uninvolved general public are as low as reasonably practicable and at a level that is acceptable to the regulator.

Draft 'Principles and guidelines for the spaceflight regulator in assessing ALARP and acceptable risk' has been published as part of this consultation. It sets out the factors to be considered by the regulator when determining whether applicants and licensees have reduced

[3] https://www.legislation.gov.uk/ukpga/1974/37
[4] US Code of Federal Regulations (CFR), Title 14, Chapter III, Parts 400-460 https://www.ecfr.gov/cgi-bin/text-idx?SID=29d02bbd50563e5013bc6664d5e73a08&mc=true&tpl=/ecfrbrowse/Title14/14chapterIII.tpl

the risks to as low as is reasonably practicable (ALARP[5]), and that the residual risk is acceptable. In brief these principles can be summarised as:

- The regulator will give priority to public safety, in accordance with section 2 of the Space Industry Act 2018;
- A decision on whether the risk is acceptable with be made once the regulator is satisfied that risks are ALARP;
- Numerical estimates of individual and societal risk will be compared with other hazardous industries in the UK and spaceflight activities from other launching states;
- Public concern will be taken into account with reference to the HM Treasury published guidance on appraising and evaluating policies, projects and programmes that may harm the public[6].

This document is intended to support consistent and transparent decision-making by the spaceflight regulator's staff by setting out the principles that underpin the spaceflight regulator's view on acceptable levels of residual risk and providing guidelines on judging whether a licensee or applicant has met the requirements to satisfy the regulator that the risks have been reduced to ALARP.

International context

Her Majesty's Government is in discussion with neighbouring countries to ensure that they are content with UK spaceflight activities in which they may have an interest. For example, if planned vehicle trajectories are near other countries' airspace or maritime Exclusive Economic Zones, there will be a need to coordinate closely with authorities in those countries.

HMG has negotiated an Agreement with the Government of the United States of America to ensure controls are in place to comply with counter-proliferation commitments and allow US spaceflight vehicles and technology to be imported and launched from the UK. The Agreement was signed by the UK and US governments on 16 June 2020 but has yet to be published and laid before Parliament for its 21 sitting day scrutiny period under the Constitutional Reform and Governance Act (2010). To enable HMG to realise some of its obligations under the Agreement, draft provisions have been included in the draft secondary legislation contained in this consultation to ensure US technology remains under the control of US participants. These draft provisions are subject to the ratification of the Agreement. For the avoidance of doubt, any references to the Agreement either in this consultation document, the draft regulations or the accompanying guidance documents is subject to the conclusion of parliamentary procedure.

The US and the UK, along with 33 other countries, are partners in the Missile Technology Control Regime (MTCR). The MTCR addresses the proliferation of missiles (including space launch vehicles) capable of delivering weapons of mass destruction (WMD) through controlling the transfer of sensitive technologies. The MTCR's concern with space launch technologies is "not designed to impede national space programmes or international cooperation as long as programmes could not contribute to delivery systems of WMD". MTCR is not itself a legally

[5] ALARP is a familiar concept in health and safety law, providing a benchmark for risk assessments under the Health and Safety at Work etc. Act 1974. The principle of ALARP involves weighting a risk against the trouble, time and money needed to control it. Further information can be found on the Health & Safety Executive website.
[6] HMT. Managing risks to the public: appraisal guidance

binding treaty – but its objectives are realised through national legislation and regulations, and full adherence to the MTCR is an important international commitment of both the UK and US Governments. The Agreement we intend to enter with the US Government is one means of ensuring that any transfer of sensitive technology relating to spaceflight activities is consistent with shared obligations under the MTCR Guidelines.

In addition to the draft legislation contained in this consultation, it is likely that additional safeguards will be stipulated in conditions attached to US export licences.

To assist in understanding the draft provisions regarding US technology contained in this consultation, respondents may find the below draft definitions useful:

“U.S. Technical Data” means information, in any form including in oral form, other than publicly available information, that is required for the design, development, production, manufacture, assembly, operation, repair, testing, maintenance, or modification of U.S. Launch Vehicles, U.S. Spacecraft, and/or U.S.-Related Equipment. Such information includes, but is not limited to, information in the form of blueprints, drawings, photographs, video materials, plans, instructions, computer software, and documentation.

“Foreign Spacecraft” means any payloads, spacecraft, groups of spacecraft, spacecraft systems or subsystems, spacecraft components (including satellites, groups of satellites, satellite systems or subsystems, and/or satellite components), and/or orbital transfer motors authorized for export to the United Kingdom of Great Britain and Northern Ireland by a government other than the Government of the United States of America, or produced as part of a declared European Space Agency program, for launch on U.S. or Foreign Launch Vehicles from U.K. Spaceports.

“Launch Activities” means all actions (including all activities relating to the reuse of reusable U.S. Launch Vehicle stages and subsystems, such as maintenance, repair, overhaul, refurbishment, reintegration, reassembly, inspection, testing, and quality assurance) associated with the launching from U.K. Spaceports of U.S. Spacecraft by means of U.S. Launch Vehicles or Foreign Launch Vehicles and the landing of U.S. Spacecraft or U.S. Launch Vehicles at U.K. Spaceports or other locations in the United Kingdom of Great Britain and Northern Ireland and the launching of U.K. Spacecraft and Foreign Spacecraft by means of U.S. Launch Vehicles, from the initial technical discussions to the launch and return of the U.S.-Related Equipment and U.S. Technical Data from the United Kingdom of Great Britain and Northern Ireland to the United States of America or other location approved by the Government of the United States of America, and, in the event of a cancelled, anomalous (i.e. any unexpected result or performance, other than a failed launch) or failed launch, the return of U.S. Launch Vehicles, U.S. Spacecraft, U.S.-Related Equipment, U.S. Technical Data, and/or any recovered and identified components and/or debris of U.S. Launch Vehicles, U.S. Spacecraft, and/or U.S.-Related Equipment to the United States of America or other location approved by the Parties.

“Technology Transfer Control Plans” means any plans developed by U.S. Licensees, in consultation with U.K. Licensees, which are approved by the relevant agency or agencies of the Parties before delivery of U.S. Launch Vehicles, U.S. Spacecraft, U.S.-Related Equipment, or U.S. Technical Data to the territory of the United Kingdom of Great Britain and Northern Ireland, and which outline security measures to be implemented during Launch Activities, including in emergency situations.

“U.K. Participants” means any persons, other than U.S. Participants, whether citizens of the United Kingdom of Great Britain and Northern Ireland or another country, who have or could

have access to U.S. Launch Vehicles, U.S. Spacecraft, U.S.-Related Equipment, and/or U.S. Technical Data, and who are subject to the jurisdiction and/or control of the United Kingdom of Great Britain and Northern Ireland.

“U.S. Launch Vehicles” means any launch vehicles, Sub-orbital Vehicles, boosters, adapters with separation systems, payload nose fairings, and/or components thereof authorized for export by the Government of the United States of America and used to carry out Launch Activities.

“U.S. Licensees” means any persons issued an export license or other authorization pursuant to U.S. laws and regulations to export, reexport, or retransfer U.S. Launch Vehicles, U.S. Spacecraft, U.S.-Related Equipment, and/or U.S. Technical Data to the United Kingdom of Great Britain and Northern Ireland.

“U.S. Participants” means any U.S. persons who are also U.S. Licensees, their contractors, subcontractors, employees, or agents, whether citizens of the United States of America or another country, or any Government of the United States of America officials or contractors, subcontractors, employees, or agents, whether citizens of the United States of America or another country, who, in connection with the issuance of a U.S. export license, participate in Launch Activities.

“U.S.-Related Equipment” means support equipment, ancillary items, components, and spare parts thereof authorized for export to the United Kingdom of Great Britain and Northern Ireland by the Government of the United States of America and required to carry out Launch Activities.

“U.S. Spacecraft” means any payloads, spacecraft, groups of spacecraft, spacecraft systems or subsystems, spacecraft components (including satellites, groups of satellites, satellite systems or subsystems, and/or satellite components), and/or orbital transfer motors authorized for export by the Government of the United States of America and used to carry out Launch Activities.

Legislative process

The Space Industry Act 2018 requires statutory instruments containing (whether alone or with other provisions) regulations to which section 68(6) of the Act applies to be made using the Parliamentary affirmative resolution procedure.

We currently anticipate that most of the secondary legislation will be in place in 2021, although this is an ambitious timetable and will be dependent on factors including the responses received following consultation and the availability of Parliamentary time.

Question

6. Are there any matters addressed in the Context and Background Information section of the consultation document on which you would like to comment? Please provide details.

The Space Industry Regulations

Part 1: Preliminary

A list of definitions used in the draft Space Industry Regulations ("the Regulations") can be found in Part 1 of the Regulations.

Some terms are not defined in the legislation as they carry their plain English meaning, for example runway, taxiway and launch pad. Terms that are already defined in the Space Industry Act 2018[7] or in Schedule 1 to the Interpretation Act 1978[8] are not defined again in the Regulations.

Some Parts of the Regulations contain definitions specific to that Part and some regulations provide definitions specific to that regulation.

Questions

7. Are there any terms used in the regulations that are not defined that you think should be defined? Please provide details.

Part 2: Appointment of the regulator

Part 2 of the Regulations covers the appointment of the regulator.

To ensure that spaceflight and associated activities are carried out safely and responsibly, we are creating a new regulator for commercial spaceflight. Successive governments have followed a policy of separating safety regulation from sector promotion to ensure regulation is impartial. On these principles it is our intention that the Civil Aviation Authority (CAA) will undertake all Space Industry Act 2018 regulatory functions in addition to regulating in-orbit activities under the Outer Space Act 1986. With regard to the Space Industry Act 2018, the functions are conferred on the CAA by regulations made under section 16 of the Space Industry Act 2018. It is our intention to produce further regulations delegating certain functions of the Secretary of State under the Outer Space Act 1986 to the CAA.

Regulation 3(1) appoints the CAA to exercise every function conferred on the regulator by or under the Space Industry Act 2018. Regulation 3(2) sets out that the CAA is not appointed to exercise functions conferred by regulations under sections 4(2) and 7(4) of the Act. These sections confer a power to grant exemptions from requirements to hold a licence. It is not our intention for the regulator to make such exemptions (see Exemptions from the need to hold an operator licence).

Regulation 4 sets out that where the CAA is appointed to exercise functions under regulation 3(1), it is appointed instead of the Secretary of State, except for exercising functions of issuing guidance to which regulation 4(1)(a) or (b) apply. For these instances the CAA is appointed as

7 http://www.legislation.gov.uk/ukpga/2018/5/section/69/enacted
8 http://www.legislation.gov.uk/ukpga/1978/30/contents

regulator concurrently with the Secretary of State. This means that either the CAA or the Secretary of State may issue guidance.

Part 3: Grant of a licence – general

Eligibility criteria and prescribed roles

Activities such as spaceflight, operating a spaceport and providing range control services come with inherent risks, so it is important that licensees are responsible and trustworthy. It is also crucial to have responsible personnel in place in key roles at organisations that carry out such activities.

Sections 3(5)(a) and 3(5)(b) of the Space Industry Act 2018 foresee regulations setting out eligibility criteria for holders of a spaceport or operator licence and prescribed roles that must be undertaken for holders of a spaceport or operator licence. Eligibility criteria and prescribed roles for range control licensees are covered by section 7(6)(a) and (e) of the Act. The eligibility criteria also apply to individuals undertaking prescribed roles. The eligibility criteria and prescribed roles are covered in Chapter 1 of Part 3 of the Regulations.

Provisions for prescribed roles in the context of individuals who must provide informed consent to take part in spaceflight activities (referenced in section 17(1) of the Act) can be found in Chapter 2 of Part 11 of the Regulations.

Our intention is to adjust the regulations so that all documents required to go to the regulator, in support of an application or otherwise, be in English or Welsh.

Eligibility criteria

Chapter 1 of Part 3 sets out the requirements around eligibility to become a licensee or to perform a prescribed role. This chapter sets out the minimum requirements and failure to meet these would render an individual ineligible to be a licensee or perform a prescribed role under the regulations contained in this Part.

The requirement to meet the eligibility criteria is ongoing under these regulations and licensees must inform the regulator if they or a prescribed role holder cease to meet the eligibility criteria.

If a licence applicant satisfies the eligibility criteria, the regulator can consider their application, including, under section 8 of the Space Industry Act 2018, whether an applicant has the necessary financial and technical resources to do what is authorised by the licence, and that the applicant, and persons performing licence functions on behalf of the licensee, are fit and proper to do so.

Regulation 5 of this Part covers the application of the eligibility criteria. The criteria in regulation 6 apply to an operator licensee, a spaceport licensee or range control licensee and any individual appointed by such licensees to undertake a prescribed role described in regulations 7, 8, 9, 10 or 11 of this Part. Regulations 5(2) and 5(3) set out the individuals to whom the eligibility criteria apply where the licensee is a body corporate or a partnership.

Regulation 6 sets out the circumstances in which an individual covered by regulation 5 will be deemed ineligible. The criteria relate to the financial (undischarged bankrupts, etc) and legal (unspent convictions for fraud, dishonesty or indictable offences) circumstances that would

preclude an individual from holding a licence or carrying out a prescribed role for the purposes of this Part. “Indictable offence” is defined in Schedule 1 to the Interpretation Act 1978[9].

Prescribed roles

Spaceport licensees

Regulation 7 lists the roles that must be undertaken by individuals on behalf of a spaceport licensee. These are:

- Accountable manager;
- Safety manager;
- Security manager;
- Training manager.

The same individual may undertake more than one of the roles listed.

The definition of accountable manager has been adapted from the definition used in Schedule 12 of the Air Navigation Order 2016[10]. It also includes elements of the accountable manager role as set out in the Civil Aviation Authority’s safety management systems guidance, CAP 795[11]. The accountable manager should be a senior manager within the organisation, for example the chief executive, chief operating officer, managing director, etc.

The safety manager is responsible for the development, operation and continuous improvement of the safety management system and acts as a focal point for safety management issues in the organisation. However, accountability for the safety management system rests with the accountable manager.

The security manager is responsible for all security aspects of the licensed activities.

The training manager is responsible for the conduct and management of the licensee’s training programme in accordance with the regulations in Part 7 on Training, Qualifications and Medical Fitness.

Further details on the security manager and training manager roles can be found in the regulations covering Security, and Training, Qualifications and Medical Fitness. It should be noted that we are currently revising the list of prescribed roles for spaceport licensees.

Operator licensees

Operator licences include launch operators, return (re-entry) operators (see definitions in Part 1 for more information) and operators who operate a non-launch vehicle space object (e.g. a satellite) in orbit. Regulation 8 requires all operators to appoint an accountable manager who is responsible for establishing and maintaining an effective management system and for ensuring that the operator’s licensed activities can be financed and carried out in accordance with the provisions in the Act, regulations and any conditions of the licence.

9 https://www.legislation.gov.uk/ukpga/1978/30/schedule/1

10 http://www.legislation.gov.uk/uksi/2016/765/contents/made

11 https://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=6616

Regulation 9 requires a spaceflight operator licensee (i.e. the holder of a launch operator licence or a return operator licence – see definitions in Part 1) to appoint an individual to perform the following role:

- Safety manager

If the operator's spaceflight activities are authorised by a launch licence, the operator must also appoint:

- Launch director
- Training manager
- Security manager

The operator must not appoint the same individual to act as both safety manager and launch director. Where an operator's licensed activities are authorised by an operator licence to which regulation 9 does not apply (e.g. the operation of a satellite in orbit) and that authorisation may give rise to any issues of national security, the operator must appoint a security manager.

Note that where a role is not prescribed under these regulations, but the regulator nonetheless believes that a role should be undertaken (e.g. in the interests of safety) given the particular nature of the licensed activities, it could still impose such a requirement via a licence condition.

Range control licensees

Regulation 11 prescribes roles for range control licensees. These are:

- Range safety manager
- Range operations manager
- Accountable manager
- Security manager
- Training manager

The range safety manager is responsible for safety in the operation of the designated range and for any safety elements of the operator's spaceflight activities which are to be carried out by personnel of the range control licensee.

The range operations manager is responsible for ensuring that the range control licensee's licensed activities are properly and safely undertaken in accordance with the range control licence and requirements imposed on the range control licensee in or under the Act.

A range control licensee may appoint an individual to undertake more than one of the roles listed.

Informing the regulator of changes

Regulation 12 creates a duty for licensees to inform the regulator in advance of proposed changes to individuals undertaking a role prescribed under this Part. This duty does not apply where such a change was not foreseeable, e.g. where the individual dies or is otherwise

unable or unwilling to continue in their role – in such a case the regulator must be informed as soon as possible. Failure to comply with this regulation is an offence under regulation 13.

Regulation 14 creates a duty for licensees under this Part to inform the regulator of changes to their circumstances that may affect their eligibility and any circumstances that mean an individual in a prescribed role would no longer satisfy the eligibility criteria. Regulation 15 creates an offence for failure to do so.

Regulation 16 creates an offence of providing false information to the regulator under regulations 12 or 14.

Regulation 17 sets out the penalties for offences under this Part. Respondent who wish to comment on regulations 12-17 are encouraged to answer question 67 of this consultation (see Part 16 – Duty to inform the regulator).

The regulations have been drafted in such a way as to allow licensees flexibility in terms of employees undertaking more than one of the prescribed roles. However, the regulator will need to be satisfied that the holder of the role is suitably experienced and qualified and that levels of staffing are commensurate to the scale and type of activities authorised by the licence.

More information on eligibility criteria and prescribed roles will be available in the guidance documents.

Questions

8. Are there any other considerations you think the eligibility criteria and prescribed roles regulations or guidance should address? Please provide details.

Exemptions from the need to hold an operator licence

Regulation 18 sets out the circumstances where a person is exempt from needing an operator licence when performing certain activities which are included as spaceflight activities under the definitions in the Act. This exemption applies to an operator of a carrier aircraft when:

- the carrier aircraft is being used to transport a space object, launch vehicle or the component parts of either from one place to another (e.g. ferry flights of a launch vehicle or transport of a satellite or its component parts) and the vehicle or space object will not be launched from the carrier aircraft, and
- the operator of the carrier aircraft either has an air operator certificate (AOC) granted in accordance with the Chicago Convention and accepted by the CAA, or has any necessary approvals, authorisations or permissions required by the State of the Operator and also accepted by the CAA.

HMG is considering exempting persons from needing an orbital operator licence, where only the procurement to launch activity is being carried out within scope of the Space Industry Act 2018 and/or Outer Space Act 1986 (i.e. where the launch of the space object would take place in the UK, but the operation of the space object in orbit is carried out from abroad and under the authorisation of a different state). This would be without prejudice to any safety and security assessments of the space object to be launched that would be required as part of the launch operator licensing process. A position has yet to be agreed, however we would welcome your views.

Grant of a licence: general

Chapter 3 of Part 3 of the Regulations covers general provisions regarding grant of a licence and renewal of a licence under the Space Industry Act 2018. This covers all types of licence under the Act: spaceport, range control and operator licences.

Section 8 of the Act states that the regulator may grant a licence if the regulator thinks fit. Section 8 (2) to (4) sets out further provisions regarding the circumstances under which the regulator may grant a licence.

Chapter 3 of Part 3 of the Regulations creates provisions under section 8 (5) to (7) of the Act. The regulations under this chapter apply to renewal of a licence as well as to grant of a new licence. Regulation 20 sets out that an application for a licence must be made in writing to the regulator in a form specified by the regulator and with the specified information.

Regulation 21 delegates power to the regulator in specifying the form and contents of an application; information to be provided with it; the procedure for rectifying procedural irregularities in an application; and timescales for actions regarding an application. It is proposed that these matters will be set out separately in rules made for the regulator.

The regulator must consider an application for a licence in accordance with regulation 22. Regulation 22(2) sets out the information the regulator must consider, while regulation 22(3) sets out further means the regulator may use to assist in its consideration of an application.

In addition, the regulator must gather information to be satisfied that the applicant is eligible to be a licensee (see Chapter 1, above) and that the requirements from the Space Industry Act 2018 set out in regulation 22(4)(b) and all other relevant requirements are met. The regulator must have regard to any licence conditions that may be imposed if a licence is granted and any views expressed by the persons consulted under section 13(6) of the Act or any other person consulted.

Regulation 22(6) sets out provision for the regulator to request further information on receipt of any information in accordance with paragraphs 22(3) and (4). Regulation 22(7) states that the regulator is a prescribed person for the purposes of section 8(7) of the Act, which allows for inspection and obtaining of information under the Regulations.

Regulation 23 sets out the information sources and possible licence conditions that the regulator must take into account in determining an application.

If the regulator grants a licence it must send the licence to the applicant in writing, including any conditions and giving reasons for their inclusion. If the regulator refuses an application for a licence it must inform the applicant in writing, giving reasons for the refusal.

An applicant may withdraw an application for a licence in accordance with regulation 27.

Questions

9. Are there any other considerations you think the grant of licence regulations or guidance should address? Please provide details.

Part 4: Grant of a spaceflight operator licence – risk

Safety is at the heart of our proposed regulatory regime; commercial spaceflight is a novel and safety critical activity that carries new and different risks from commercial aviation. The regulator must not grant an application for an operator licence unless satisfied that certain safety requirements and assessments have been met.

Risks to persons who are not taking part in spaceflight activity

Section 9 of the Act requires an applicant for an operator licence to reduce risks to persons who are not taking part in a spaceflight activity in a prescribed role or capacity to as low as reasonably practicable (ALARP). The ALARP[12] principle involves weighing a risk against the trouble, time and money needed to control it. Thus, ALARP describes the level to which the regulator will expect to see risks controlled.

The residual risk must be acceptable. The prescribed roles and capacities are crew and spaceflight participants (referred to as “human occupants”). An additional risk assessment is required if the launch vehicle is intended to carry human occupants (see below).

The regulations set out the steps to be taken by the applicant to conduct both a flight safety analysis (regulations 29 and 31) and ground safety analysis (regulations 30 and 31) The first objective is to identify the major accident hazards arising from spaceflight activities and assess their likelihood and consequences. The applicant must then define the appropriate control measures to prevent each major accident or mitigate the consequences should a major accident occur. They must also specify appropriate performance standards for these risk control and mitigation measures, establish mechanisms for reviewing the safety analysis and produce a safety operations manual.

Major accident hazards are those that could cause a “Major accident” defined as an accident arising out of or in the course of spaceflight activities or preparation for spaceflight activities that is highly likely to cause death or serious injury to, or destroy or seriously damage the property of, persons who are not human occupants of the launch vehicle.

The flight safety analysis should consider major accident hazards arising from the commencement of launch (including if taking-off attached to a carrier aircraft) until the conclusion of the licensed spaceflight activity. When identifying these hazards, the applicant must consider the hazards referred to in paragraph 15(1) of Schedule 1 “Information the safety case must contain” and when carrying out the overall flight safety analysis the applicant must take into account the matters listed in paragraph 15(2) of Schedule 1.

Applicants are required to conduct a fully quantitative assessment that considers both individual and societal risk for each major accident scenario identified as part of the flight safety analysis. An assessment of the risk from individual hazards is required to provide insight into the specific activities and to guide the application of controls and mitigations. An ‘aggregate’ or ‘total’ numerical estimate of risk should also be provided as an indication of the overall level of risk relative to other major hazard industries in the UK and spaceflight activity in other launching states. The regulations do not prescribe a methodology for calculating this numerical estimate, but the applicant should be able to explain their chosen methodology and metrics.

12 http://www.hse.gov.uk/risk/theory/alarpglance.htm

The ground safety analysis should consider major accident hazards arising during preparations for the launch and those that could arise upon, or after, landing. An applicant must consider the hazards referred to in paragraph 16 of Schedule 1. There is no requirement to calculate a numerical estimate of the risk, but the depth of analysis should be proportionate to the major accident hazards and risks.

The applicant is required to submit to the regulator a safety case, the required contents of which are set out in regulation 32 and Schedule 1. The safety case serves to provide a structured body of evidence, derived from the flight safety and ground safety analysis, to demonstrate that the applicant's spaceflight activities: have levels of the risks reduced to ALARP; will be able to meet the spaceflight safety requirements in regulations, and are otherwise acceptable. Our intention is to amend regulation 32 and Schedule 1 to make it more apparent that the flight safety and ground safety analyses are required to ensure that the risks are ALARP.

There is no prescribed format for the safety case, but it must include:

- General information and technical particulars set out in Schedule 1;
- The outcomes of the flight and ground safety analyses in particular;
- A summary of the potential major accidents, their likelihood and consequence;
- Details of the risk controls and mitigation measure identified for each major accident and a summary of the safety management system to show how it will deliver and maintain the measures described;
- A demonstration that the risks are ALARP including information concerning any measures to prevent or to control or mitigate the consequences of an identified hazard that the applicant considered but does not intend to implement; and an explanation of why it was not reasonably practicable to implement those measures.

Our intention is to update the 'General Information' section of Schedule 1 to include a requirement to provide a flight history and to describe the environment around the site and under the proposed trajectories. It is also our intention to update the 'Technical Particulars' of Schedule 1 to ensure that the regulator has a complete picture of the proposed spaceflight activities when considering an applicant's safety case. For example, the delivery of technical note explaining the quality management system is likely to be needed. If there is any further information that should be identified in Schedule 1 that you think is necessary for the safety case to contain, please provide a response to Question 14 in the Consultation Document.

Principles and guidelines for the regulator setting out its approach to determining ALARP and whether the level of the residual risk is acceptable have been published as part of this consultation.

Questions

10. Schedule 1 details the types of information required by the operator on the manifested payload(s) ahead of launch, and the use/presentation of this information within the safety case, as well as how this information will be used by the regulator. Do you have any comments on the proposed approach? Please provide details.

11. Paragraph 5 of Schedule 1 requests a schedule of the preparatory events linked to the safety of a launch campaign. This includes grouping events into 'days ahead of

launch.' Do you have any comments on the fidelity of the events? Please provide details.

12. The Regulations explain how the safety case can be used to demonstrate the safety of single or multiple missions. Do you have any comments about this approach? Please provide details.

13. The Regulations set out the elements of the safety case for spaceflight operators, including the minimum requirements. Do you have any comments on the safety case or the minimum requirements? Please provide details.

14. The information the safety case must contain is set out in Schedule 1 – is there any further information you think it should be necessary for the safety case to contain or anything currently in the requirements that should not be in the safety case? Please provide details.

15. What do you understand by the phrase (the launch vehicle or carrier aircraft's) "method of operation" in the safety case requirements set out in Schedule 1? Please provide details.

16. Do you agree with the list of safety critical systems in paragraph 11 of Schedule 1? Please provide details.

17. Do you think licensees should share their safety cases with other users/potential users of the spaceport or those other users who have prepared a safety case? Please provide details.

18. If you intend to apply for a spaceflight operator licence, would you share your safety case with other users/potential users of the spaceport or other users who have prepared a safety case? Please provide details.

As well as the safety case, regulation 33 also requires an applicant to provide to the regulator a copy of the safety operations manual. This is a document that must contain all such information, procedures and instructions as may be necessary for the operating staff to carry out their duties in connection with the operator's spaceflight activities safely. When producing the safety operations manual, the applicant must consult any proposed spaceport licensee and any proposed range control service provider.

The requirements for a safety operations manual are set out in regulations made under section 19(1)(b) of the Space Industry Act 2018 (see safety of operator's spaceflight activities section of this document).

Risk assessment for crew and spaceflight participants

Chapter 3 of Part 4 of the Regulations encompasses the risk assessment requirements for persons who are to take part in spaceflight activities in prescribed roles and capacities. These prescribed roles and capacities are specified in regulation 34 and consist of members of the crew and spaceflight participants, who are referred to as "human occupants".

The risk assessment for human occupants is a supplemental, additional requirement to the safety case if flights with human occupants are proposed, and not a substitute for the safety case.

Chapter 3 also sets out the information to be provided to the regulator about the risk assessment. If it is not intended to fly persons on board a spacecraft, the applicant need not submit a risk assessment.

Regulation 35 prescribes the requirements for risk assessment. An applicant must identify hazards that could harm the health or safety of human occupants at any time from the period when the human occupant boards the launch vehicle for the purpose of being carried on it during the proposed spaceflight activity up to when all human occupants have disembarked. For each hazard identified an applicant must identify and assess the hazard in accordance with the regulations and define any appropriate measures to take to prevent it occurring and mitigate its consequences if it does occur.

Although all hazards must be considered by the applicant in the risk assessment, particular hazards that could occur during routine operations (i.e. likely to be present on every flight) as well as during emergencies, are described at Schedule 2

The applicant is not obliged in these regulations to demonstrate that the risks to human occupants on board have been reduced to ALARP or are acceptable to the regulator. The safety regulations at Part 8, Chapter 5 do however require certain mandatory additional safety requirements for launch vehicles with human occupants, including requirements relating to:

- the crew,
- the launch vehicle including essential systems that must be on board, emergency equipment and the atmospheric conditions that must be provided for on board the vehicle for the occupants.

There are also training requirements for crew and spaceflight participants as well as medical fitness requirements in the training regulations at Part 7.

The ability to fulfil these requirements must be demonstrated to the regulator. Each member of crew and spaceflight participant must be given details of the risk assessment referred to. As the launch vehicle will not be certified by the regulator and given the very early stage of commercial human spaceflight, it is the responsibility of anyone participating in human spaceflight activity, as a member of the crew or as a participant, to have signified their informed consent to accept the risks involved in those activities.

This procedure is more fully explained in the informed consent section of this document and in the guidance. Provision of informed consent is a legal requirement, and it is an offence for a licensee to allow an individual to take part in spaceflight activities without securing this. It is therefore for the individual participating in the spaceflight activity to decide, after having received details of the risk assessment and other information, whether the risks are personally acceptable and whether they wish to continue.

Questions

19. Are there any other considerations you think the spaceflight regulations or associated guidance should address with regards to safety? Please provide details.

Part 5: Grant of a spaceport licence

Chapter 2 of Part 5 of the Regulations contains regulations made under Section 10(b) of the Space Industry Act 2018 prescribing additional requirements for the grant of a spaceport licence. It sets out the requirements that an applicant for a spaceport licence must fulfil before the regulator can grant a licence (e.g. provide certain documentation at application stage).

These requirements, alongside the requirement for a spaceport assessment of environmental effects under section 11 of the Act, are designed to enable the regulator to consider whether the proposed siting of the spaceport is appropriate for the proposed spaceflight and associated licensed activities.

Location requirements for horizontal spaceports

Regulation 38 sets out location requirements that only apply to applicants for a horizontal spaceport licence. These are defined in Part 1 – where spaceflight activities require use of a runway.

Horizontal spaceports must be located at an aerodrome which is either European Aviation Safety Agency (EASA) certified or licensed under the UK Air Navigation Order. As such they shall be subject to the relevant existing regulations under those civil aviation regimes in addition to the requirements set out in the Regulations. This requirement will ensure that horizontal spaceports have appropriate infrastructure, equipment and services to support spaceflight activity, such as a runway, taxiway and apron areas.

If the site of a proposed horizontal spaceport does not hold an EASA certificate or licence under the ANO, it must obtain one before it can be granted a spaceport licence.

In addition, the aerodrome must be directed under the National Aviation Security Programme (NASP). This requirement ensures appropriate and proportionate levels of security at the horizontal spaceport. See Part 10 for further security requirements for spaceports.

Safety Case requirement

Regulation 39 requires that an applicant must conduct a safety case.

A safety case is a body of evidence providing a demonstrable and valid argument that a system or equipment is safe for use within a defined envelope, combined with the argument that makes sense of the evidence. We have taken this outcome-based approach because it requires the licensee to assess the hazards and risks specific to their operation and to demonstrate to the regulator how it will mitigate these. This is important for developing spaceflight activities where the alternative approach of setting prescriptive requirements may not continue to capture emerging technologies or best practice. The safety case is key to demonstrating that the risks are ALARP and we will be clarifying this in the Regulations.

Paragraph 3 requires that the applicant's safety case must take account of any operator licensee using the spaceport and any other spaceport users. If there is more than one launch operator carrying out activities at the spaceport it will be necessary to ensure that each operation carried out by a launch operator at the spaceport does not create unacceptable risks that could result in harm to the public or other users of the spaceport. Other users include any launch operator and any contractor, subcontractor or customer at the spaceport.

In the case of horizontal spaceports, the safety case must also take into account the aerodrome licence holder. Operations involving spacecraft or carrier aircraft will have to be integrated with, and segregated from, aviation activity, depending on the type of operation being conducted and the level of activity at the location.

Paragraph 4 sets out the minimum information that the safety case must contain - including activities to be carried out at the spaceport, the location and layout of the site and any spacecraft licensed to operate from the spaceport.

Paragraph 5 requires an assessment of possible accident or incident scenarios and of the likelihood and severity of the consequences and mitigation measures applied. The findings of these assessments inform the safety clear zone requirement in paragraph 6 and subsequent measures controlling access to this zone.

The effect of paragraphs 1, 2 and 7 of regulation 39 is that, where known to the applicant, the safety case must be based on the actual launch vehicles that will be using the spaceport if the spaceport licence application is successful. This is likely to require the spaceport licence applicant to obtain information about launch operators who are or will be applying for launch licences at that site. Paragraph 7 provides that if the spaceport licence applicant does not yet have such details, they should base their safety case on the types of vehicle it envisages using the spaceport. For example, if a prospective horizontal spaceport intends to attract launch operators that would use carrier aircraft for air-launch of rockets, then it should base its safety case on that type of technology.

Once a licence is granted, the safety case will be used as the basis for ongoing monitoring and assessment of spaceport activities.

Safety regulations also set out the circumstances when the safety case must be reviewed, and where necessary, revised (see Part 9 – Spaceport Safety).

Questions

20. If you intend to apply for a spaceport licence, would you share your safety case with other users/potential users of the spaceport or those other users who have prepared a safety case? Please provide details.

21. Regulation 39(3)(a) requires the spaceport licence applicant to take into account any operator licence applicant in developing its safety case. Similarly, regulation 31(4)(b) requires an operator licence applicant to consult any proposed spaceport licensee on its operating manual. Do you see a need for a specific requirement for spaceport and operator licensees to share their respective safety cases and ground safety analysis? Please provide details.

22. It is foreseeable that there will be an overlap between the ground safety analysis conducted by a launch operator and the spaceport's safety case. Regulations are drafted to meet the specific requirements for each type of licence. Do you see any aspects of the spaceport safety case regulations that should more closely align with regulations 30 and 31? Please provide details.

Safety Clear Zone Requirement

Regulation 40 requires the spaceport applicant to show that it can put in place appropriate safety clear zones during hazardous pre-flight and post-flight operations to ensure that the

risks to individuals from blast over pressure, fragmentation debris, thermal radiation or toxic release are as low as reasonably practicable.

A safety clear zone is an area to which access is restricted for safety reasons while particular tasks are being undertaken such as loading or unloading propellent from a spacecraft or static engine testing.

The definition of “hazardous pre-flight and post-flight operation” here is any activity at the spaceport, the carrying out of which involves a risk to any person from explosive debris, peak incident overpressure or toxic release.

Different safety clear zones will be required for different activities. In some cases, it may be necessary to prevent any person accessing the area; in other cases, it will be sufficient to restrict access. For example, a safety clear zone might allow authorised operator or spaceport operating staff to carry out essential activities related to spaceflight activities, but prevent any unauthorised staff or members of the public from accessing the area.

The safety case assessments made under paragraph 5 of regulation 39 will determine what safety clear zone is appropriate for particular hazardous operations.

Paragraph 2 of regulation 40 disapplies the requirement for a safety clear zone, if the safety case demonstrates that none is required.

Siting Assessment

In addition to producing a safety case and identifying appropriate safety clear zones for the proposed spaceport, regulation 41 requires licence applicants to conduct a siting assessment.

As with the safety case, the siting assessment must be based on the actual launch vehicles that plan to use the spaceport, or representative launch vehicles of the type the spaceport seeks to host.

Paragraph 2(c) requires that the siting assessment must generate a numerical estimate of the annualised risk of death or serious injury to members of the public posed by the proposed spaceflight activities. Therefore, a licence applicant will need to assess risk based on the proposed number of launches per year – and, where more than one operator will use the spaceport, be based on all proposed launches.

Paragraph 3 of regulation 41 requires that the numerical estimate of risk must be acceptable to the regulator.

Members of the public

The regulator must carry out its functions relating to spaceflight activities so as to secure public safety. This duty has primacy over the other matters that the regulator has to take into account in exercising its functions.

“Public safety” is defined in the Act as the health and safety of members of the public and the safety of their property. Section 2(7) of the Act allows for regulations to prescribe the meaning of “members of the public” for the purposes of any provision of the Act that refers to public safety.

Chapter 3 of Part 5 of the Regulations sets out the prescribed meaning of “members of the public” for the purposes of the reference to public safety in section 10(a) of the Act, which relates to spaceport licences.

In all other instances “members of the public” would have its natural meaning of being uninvolved persons.

Regulation 42 sets out the prescribed meaning of “members of the public” for the purposes of section 10(a) of the Act.

An individual who is listed in regulation 43 and who is voluntarily in close proximity to a source of danger at a spaceport (as set out in regulation 42(b) is not considered to be a member of the public for the purposes of section 10(a).

Regulation 43 lists persons who are not considered members of the public if they are voluntarily in close proximity to a source of danger at a spaceport. These include:

- Employees, contractors, officers, partners etc of licensees;
- Individuals including crew and spaceflight participants who have signified their informed consent to take part in spaceflight activities (see the Informed consent section of this document);
- Individuals taking part in spaceflight activities who have not signified their informed consent;
- The emergency services, security services and Her Majesty’s armed forces;
- An employee of the regulator or a qualifying health and safety authority;
- An employee of the SAIA (see the Accident Investigation Regulations);
- Compliance authority personnel;
- Individuals at a spaceport at the invitation of a licensee;
- Individuals acting on behalf of the government of another country in connection with spaceflight activities.

Question

23. Are there any other considerations you think the grant of a spaceport licence regulations and associated guidance should address? Please provide details.

Part 6: Range control services

Part 6 of the Regulations, made under sections 5 and 7 of the Space Industry Act 2018, sets out the requirements that have to be met by the holder of a range control licence both with regard to their organisation, and to the activities they will be carrying out.

The regulations apply to the provision of range control services for operations authorised under launch operator or return operator licences; i.e. range control services carried out from a designated site defined in the range control licence. They are targeted at range operations that

will be based in the same area over a longer period of time to support multiple launches. For operations that could require a temporary range, such as for re-entry of satellites, we intend to impose licence conditions under section 13 of the Act to reflect any particular requirements relating to the provision of such range services.

Questions

24. The regulations allow licensing of range control services from a designated site, but this does not preclude more than one licensee from operating at the same site at different times. The licensing system will also allow a licensee to operate from more than one site if desired, or to apply for their existing licence to cover a new site, under a licence variation.

    Do you think there are any drawbacks to the overall approach to sites for range control licensees? Please provide details.

25. The range regulations have been drafted to facilitate different models of range control emerging in the future, and separate out the different functions that a range control licensee might provide such as issuing of notifications or monitoring of hazard areas. Note though that our intention is to ensure that there is a single range control licensee providing services for a launch operation, rather than allowing multiple licensees to work together to provide different elements of the range control services needed for that launch. This is to ensure that there is a single point of accountability, given the safety-critical nature of range control services. The Act however does allow a range control licensee to use another organisation to provide additional range services as its agent through sub-contracting under their licence.

    Do you agree that there should be a single licensee providing the range control service for a launch operation? Please provide details.

26. The proposed licensing model for range control allows an applicant to apply for a licence based on their proposed operation and the equipment, personnel and qualifications needed to provide it. Therefore, if the applicant wished, they could apply for a licence based on these attributes ahead of identifying the designated site that they intend to operate from, and identify this site at a later date. The regulator would still need to assess the licensee to be assured that their services will operate effectively from the designated site. This could be desirable for applicants in that it allows greater flexibility and reduces barriers to enter the market, but some concerns have been raised that this introduces greater uncertainty into the licensing process in that it means site-specific assessments will be happening later in the process, and potentially closer to the time of launch.

    Do you think that the system should allow a range control licence to be awarded without the designated site being identified? Please provide details.

Licensee’s organisation and management

Regulation 45 sets out certain requirements relating to the range control licensee’s organisation that the licensee must maintain in place in order to provide the service that the licence authorises. This includes financial and technical resources, sufficiently qualified and experienced personnel, and the appropriate equipment required to provide tracking and surveillance services, such as radar.

Agreements with relevant authorities

During and prior to a launch operation the range control licensee will need to co-operate with certain organisations in order to ensure that the range is managed safely. For example, with the air navigation service provider responsible for that area to ensure the issuing of notifications such as NOTAMs[13], or to provide information during the operation. Regulations 46 to 48 set out the organisations with which an agreement must be in place, some parameters about which areas the agreements must cover, and requirements about the communication networks that must exist between the range control licensee and such organisations.

The range and hazard areas

The range control licence will set out the designated site within which the licensee is authorised to provide range control services. Further to this, each launch operation will require a particular set of range measures specific to that operation to be identified, for example, identifying hazard areas such as where a spent stage will fall during launch. These measures are termed here the ‘designated range’ for a particular launch operation.

Regulation 49 sets out a requirement for a range control licensee to identify the designated range for a launch operation to which they are providing range control services, as well as the things that must be taken into account when identifying this, such as the characteristics of the launch vehicle or the capabilities of the range control licensee’s tracking or surveillance equipment.

Regulation 50 sets out some requirements on hazard areas within the designated range and how they must be managed. Regulation 51 sets out some requirements on the monitoring of hazard areas, as well as reporting of incidents such as unauthorised entry to the range.

Notification requirements

Regulations 52 to 54 set out the requirements for ensuring that certain people are notified about spaceflight activities happening within the range area, to ensure that people are not put at risk by spaceflight activities, and do not pose a risk themselves to those activities. Regulations 52 and 53 set out the people and organisations that must be notified and how. Regulation 54 sets out some requirements about issuing of warning notices, including to the general public.

Quality management system

Regulation 55 sets out a requirement to have management systems in place to ensure the quality and reliability of the safety-critical services that the range control licensee is responsible for. For example, systems to ensure that radar equipment used for tracking or surveillance will function properly during a launch operation.

Note that for spaceport and spaceflight operators, there is a requirement for a safety case, and a corresponding safety management system to be in place. Since a range control licensee is not required to provide a separate safety case for their activities, there is no requirement for a safety management system under these regulations. However, a range control licensee will still be required to have a safety management system in place under existing health and safety

[13] Notices to Airmen

regulations[14]. The range control services in place will be considered as part of the safety case for the launch operation itself.

Applicable conditions where a spaceflight operator provides range control services to itself

Provision of range control services is a safety-critical activity and it is important that the range function retains a degree of independence from some other elements of the launch operation. Whilst the Space Industry Act 2018 does not prohibit a spaceflight operator holding a range control licence and providing range control services in respect of its own spaceflight activities, regulation 57 sets out the requirements with which the spaceflight operator must comply with regard to the operation of its organisation to ensure that the provision of the range control services is not compromised or adversely affected due to a conflict of interest arising from the pursuance of its spaceflight activities.

Questions

27. Do you think that the requirements to ensure the independence of the range function are proportionate? Please provide details.

28. Are there any other ways of ensuring this independence? Please provide details.

29. Are there any other considerations you think the range control regulations and associated guidance should address? Please provide details.

Part 7: Training, qualifications and medical fitness

General

Activities around launch come with inherent risk so it is important that people who take part in such activities and who have responsibility for their safe operation are competent and fit to carry out their functions.

Section 18 of the Space Industry Act 2018 allows for regulations to make provisions regarding the training, qualifications and medical fitness of individuals taking part in spaceflight activities, providing range control services or working at a space site.

These regulations can be found in Part 7 of the Regulations.

The draft Regulations are informed by established regulations administered by the Federal Aviation Administration – Office of Commercial Space Transportation in the US[15] and, where applicable, from existing commercial civil aviation legislation[16]. Despite this, the unique aspects of spaceflight mean that not too much can be derived from aviation regulations, particularly

[14] https://www.hse.gov.uk/managing/core-elements.htm
[15] https://www.ecfr.gov/cgi-bin/text-idx?SID=f971375c6d28a387c40869e8cdb9c2cf&mc=true&node=se14.4.460_17&rgn=div8

[16] Annex III 'Essential requirements for pilot licensing' of Regulation (EU) 216/2008 https://www.easa.europa.eu/document-library/regulations/regulation-ec-no-2162008; Annex IV ('Part-MED') to Commission Regulation (EU) No 1178/2011 https://www.easa.europa.eu/document-library/regulations/commission-regulation-eu-no-11782011

concerning the extent and completeness of training regimes and the difficulty with imposing standardisation or licensing at such an early stage.

The policy proposals were also informed by discussions and investigatory visits with the space industry and flight and medical experts in commercial and military aviation. The Civil Aviation Authority has a limited programme in place to better understand the physiological and training requirements that may be necessary for the wider range of persons who will take part as spaceflight participants. It is recognised that regulations may have to be amended in the light of actual commercial spaceflight operations and the empirical evidence that will start to emerge once these operations commence regularly.

Regulation 58 of Part 7 of the Regulations sets out definitions that are specific to this Part. For the purposes of this Part “licensee” means a person who holds a launch operator licence, a return operator licence, a spaceport licence or a range control licence under the Act. This means that where requirements are placed on licensees in this Part, these do not apply to licensees who operate a non-launch vehicle space object (e.g. a satellite) in orbit.

“Relevant individual” means an individual who performs any specified role or has a specified capacity.

Regulation 59(1) sets out the roles that are specified for the purposes of section 18(4) of the Space Industry Act 2018.

These are:

- the training manager;
- the launch director;
- the flight termination personnel;
- the flight crew and remote pilots;
- the engineer;
- the range operations manager;
- the range safety manager.

According to section 18(4)(a) of the Act licensees must also not allow unqualified individuals to take part in, or to be otherwise engaged in connection with, activities authorised by the licence, or providing services the provision of which is authorised by the licence, in a specified role or capacity.

Section 18(4)(b) of the Act prohibits licensees from allowing unqualified individuals to work in a specified role or capacity at a site used for or in connection with the activities or services to which the licence relates.

An individual is “unqualified” if they do not fulfil specified criteria with respect to training, qualifications and medical fitness.

The specified criteria are listed in regulation 59(2) and Part 1 of Schedule 3 to the Regulations.

Regulation 60(1) of Part 7 states that spaceflight participant is a specified capacity for the purposes of section 18(4)(a) of the Act.

Regulation 61(1)(a) sets out the responsibilities of the licensees and the conditions regarding training, qualifications and medical fitness that an individual must meet if they perform a specified role or have a specified capacity; these persons are referred to as 'relevant individuals'. Regulation 61(1)(b) refers to the conditions for individuals who do not perform a specified role or capacity. In general, the training regulations are mostly concerned with persons who perform in a specified role or have a specified capacity. Regulation 61(2) sets out the conditions that are to be met by relevant individuals.

Regulation 61(3) sets out the conditions those persons who are participating, but do not perform a specified role or capacity, must satisfy regarding participation in a training programme appropriate to their role, being assessed as competent and to remain medically fit. Because these persons are not 'relevant individuals', the licensee does not need to ensure these persons are 'qualified' in the same sense that applies to the listed relevant individuals. This policy is intended to avoid setting out prescriptive criteria for non-specified persons whose role has an operational or safety purpose during launch. These persons are likely to include certain aerospace engineering roles, ground operations staff, persons handling hazardous materials or who have a role in assembling, checking or handling propellants pre-and-post flight, or those providing rescue and fire-fighting services, for example. For the most part, the licensee is responsible for deciding what training and medical fitness is appropriate for these persons.

This principle of only concentrating on a limited number of key roles, has been established in recognition of the fact that an employer has existing statutory obligations to its staff with regard to training and other safety-at-work matters arising from the Health and Safety at Work etc. Act 1974[17]. Existing health and safety legislation will apply to licensees in addition to the Space Industry Act 2018 and the regulations made under it, as well as existing regulations concerning, for example, the handling, storing and transporting of hazardous substances (see also the sections on safety in this document). As part of their safety case, an applicant may also supply evidence of training (or the intention to train) for any person or groups of persons involved in spaceflight activities. Such evidence could be used to demonstrate the measures the applicant intends to take to prevent or mitigate a major accident (regulations 31(1)(f)).

Regulations 61(4) and (5) set out the conditions that have to be satisfied by remote pilots of spaceflight operators holding return operator licences.

It is the licensee's responsibility to ensure the conditions set out in regulation 61 are met. For these purposes, regulation 61(6) states that the licensee must establish and maintain a training programme and manual in accordance with regulations 72 and 69 and ensure that relevant individuals are medically fit to perform their duties in accordance with regulation 75(1).

Regulation 61(7) covers how licensees may satisfy their obligations in relation to relevant individuals who are not their employees or spaceflight participants.

Regulation 61(8) sets out requirements for a licensee to have in place a training management system.

Regulation 62 sets out the requirements licensees must satisfy concerning adequate training resources. This includes provisions relating to personnel, facilities and equipment, including those provided by third parties.

[17] https://www.legislation.gov.uk/ukpga/1974/37

Regulation 63 sets out the requirements for licensees concerning record keeping for training, qualifications and medical fitness. The records listed must be kept for at least two years beginning on the first day of the calendar year after they were created.

Questions

30. Do you have any comments on regulation 61 “responsibilities of licensees” (and dependant training regulations)? We are particularly interested in whether you think the training requirements should concentrate solely upon the listed relevant individuals (i.e. those who must be qualified). Please provide details.

31. Do you think the requirement for licensees to keep their training, qualifications and medical fitness records for at least two years, beginning on the first day of the calendar year after they were created, is appropriate? Please provide details.

The training manager

Chapter 2 of Part 7 sets out the requirements for the training manager. The training manager is a prescribed role for spaceport licensees, licensees holding a launch operator licence and range control licensees (see eligibility criteria and prescribed roles).

Regulation 64(1)(a) states that the training manager must satisfy the eligibility requirements set out in regulations 5 and 6 of Part 3.

The appointment of the training manager must be approved by the regulator, as set out in regulation 64(1)(b). This is in accordance with Schedule 2 of the Space Industry Act 2018, which gives power for regulations to require approval by the regulator of persons providing training and the content of training to be provided. The approval of the training manager is tied to the individual licence to be granted and is not transferrable between licensees.

The training manager must be an employee of the licensee, including where training services or medical assessments are provided by third parties. The training manager’s responsibilities are set out in regulation 64(3). These include performing the functions listed in regulation 66.

Regulation 67 covers the criteria the regulator will take into account in approving the appointment of the training manager. Regulation 68 covers termination of the training manager’s approval.

Training manual

Chapter 3 of Part 7 covers training manual requirements. It is the licensee’s responsibility to compile their training manual. They must do so in accordance with the requirements set out in Part 2 of Schedule 3 and apply to the regulator for approval of the relevant sections of the manual. Once approved, the licensee is required to share relevant sections of the manual with its staff and any additional persons contracted to train them. Each copy of the training manual must be kept up to date and the licensee must submit certain types of changes (see regulation 71) to the regulator for approval. The approval of the training manual is tied to the licence concerned and is not transferrable between licensees.

Training programme

Chapter 4 of Part 7 sets out the requirements for a training programme. The licensee must establish and maintain a training programme in accordance with regulation 72. For relevant individuals the training programme must include initial, proficiency and readiness training.

The objective of initial training is to ensure individuals are familiar with the licensee's organisation, methods of working, safety rules and procedures and the regulations that apply to the licensee and its licensed activities.

The objective of proficiency training is to ensure that individuals can adequately carry out their role and function (see the specified criteria at Part 1 of Schedule 3 and the training for specified roles and capacities at Part 3 of Schedule 3).

The objective of readiness training is to ensure that individuals adequately understand the objectives of a particular mission, have rehearsed the role they are to perform during the mission and have demonstrated adequate performance in that role.

Spaceflight operations may rely on control of the flight and decision-making from the ground-based operations, range and spaceport staff as well as (for horizontal launch and spaceflight with human occupants), crew onboard spacecraft and carrier aircraft. This high level of coordinated activity during all stages of flight may require a greater degree of integration during rehearsals depending on the complexity of the mission.

The levels of training recognise the fact that the training process is likely to be progressive and to allow individuals to enter training at different stages as appropriate to their current training status and eventual role.

The training programme must also include safety instructions for individuals who do not perform a specified role or act in a specified capacity and include assessments to determine what training is required by relevant individuals. Assessments to determine whether individuals have received and successfully completed courses of training and whether individuals are competent to perform their functions in relation to the licensed activities must also be included.

Regulation 73 covers training and assessments. Competence assessments must be conducted at intervals determined by the training manager. Individuals who have failed a competence assessment relevant to a function, must not perform that function until they have undertaken further training and passed a further competence assessment. For flight crew and remote pilots training and competence assessments must cover all phases of flight of the spacecraft to which they will be assigned.

Question

32. The Regulations (see regulation 73(5)) currently only mention the need for the operator to perform simulations prior to launch to demonstrate safety. Do you think this should include rehearsals? Please provide details.

33. Do you have any comments on the type of rehearsals or simulations that are/could be required? Please provide details.

Licensees must ensure they have access to sufficient training equipment to provide any practical training required as part of their training programme, in accordance with regulation 74.

Human spaceflight operations require a large proportion of training to be conducted on the ground or in conventional aircraft mimicking a spacecraft. The risks and costs of training during actual spaceflight can be substantial, including an inability to simulate certain abort and emergency scenarios. It is expected that ground-based simulations will be extensively used for the practical training as required by the training programme. The intent behind regulation 74 is that equipment providing these simulations exhibits as high a degree of fidelity as possible and any differences are identified and described.

Medical fitness

Chapter 5 of Part 7 covers medical fitness. The medical fitness requirements are informed by existing legislation applicable to civil aviation, for example the "Part-MED"[18] requirements.

Regulation 75 sets out the licensee's obligations regarding the medical fitness of crew members of the spacecraft, remote pilots, spaceflight participants and other participants in the licensed activities.

Medical examinations must be performed by an aeromedical examiner who is suitably qualified by the General Medical Council, has qualifications in aviation or space medicine and approved by the CAA. Medical assessors must be employed and authorised by the CAA.

Regulation 76 covers the requirements regarding certificates and confirmation of medical fitness for individuals taking part in spaceflight activities on board a spacecraft or training for such activities. The intent is to ensure that requisite medical examinations have been carried out to ensure that individuals are medically fit to participate in the spaceflight activities proposed for that individual, and to carry out that individual's duties (if any) in relation to those activities.

A person who is a member of the flight crew (other than balloon pilots) or a remote pilot, must be able to meet the requirements for a Class 1 certificate for single pilot commercial air transport operations carrying passengers set out in section 2 of Sub-Part B of Annex IV to the EU Aircrew Regulation.

Regulation 76 sets out requirements related to illness, injury and related conditions of crew members and remote pilots, including conditions and circumstances when an individual must not act as a member of crew or remote pilot. If these individuals suffer illness or injury rendering them incapable of performing their functions as a member of the spacecraft crew, or as a remote pilot, on recovery they must receive a medical assessment to confirm whether they are fit to take part in spaceflight activities. The same requirement applies to suspected pregnancy; operations and invasive procedures; the commencement of medication; and admission to a hospital or medical clinic.

Once an individual has recovered from the listed illnesses, injuries and conditions, that individual must be assessed and both the licensee's approved medical examiner and an approved medical assessor appointed by the CAA must agree that the individual is fit to take part in spaceflight activities.

[18] Annex IV ('Part-MED') to Commission Regulation (EU) No 1178/2011 laying down technical requirements and administrative procedures related to civil aviation aircrew. Part-MED contains the requirements for medical certification of pilots and the provisions for medical fitness of cabin crew. http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011R1178&from=EN

Regulation 78 sets out the considerations licensees must make in deciding whether spaceflight participants with a disability or reduced mobility may take part in a spaceflight.

Regulation 79 covers the validity of medical certificates. A medical certificate shall not be valid for more than 12 months. Regulation 80 covers record keeping.

Schedule 3 provides further provisions regarding specified criteria; the training manual; and training for specified roles and capacities.

More information on training, qualifications and medical fitness will be available in the draft guidance documents for launch operator licences, orbital operator licences, spaceport licences and range control licences. More information regarding security training can be found in the Security section.

Questions

34. Are there any other considerations you think the training, qualifications and medical fitness regulations or associated guidance should address? Please provide details.

Part 8: Safety of operator's spaceflight activities during the launch operator licence or the return operator licence

Regulations made under section 19 of the Act provide the foundation for safe spaceflight activities and work together with the licensee's continuing safety case to establish a clear safety basis upon which a licensee can plan and execute their activities. The safety regulations are proportionate and objective-based, allowing licensees to comply with them in accordance with the type of spaceflight activity they are carrying out.

Relationship with risk regulations

Regulations have been drafted under section 9 of the Act in respect of the safety assessments that must be carried out by an applicant before a licence can be granted (see grant of a spaceflight operator licence - risk section). The primary safety assessments are those in the safety case which, combined with the other information to be supplied in the safety case, act to estimate risk and show that it has been reduced to ALARP.

Together, the safety case and the safety operations manual form the basis of how the licensee will safely carry out its particular licensed spaceflight activity and how it will comply with each applicable safety regulation. It is important for an applicant to consider the spaceflight risk regulations and safety regulations together since important elements of both are interlinked. Once a licence is granted, the licensee will then be expected to comply with the safety regulations and keep the safety case up to date. The safety case is a living document that reflects an up-to-date picture of operations, hazards risks and mitigations.

A similar process is established for the additional risk assessment that is needed if the licensee is to carry out sub-orbital spaceflight with human occupants.

The spaceflight operator's safety duty

Chapter 2 of Part 8 of the Regulations sets out the spaceflight operator's duty to secure that its spaceflight activities are carried out safely. The spaceflight operator does this by securing the

safety of individuals in accordance with the current safety case, and, in the case of spaceflight activities with human occupants, in accordance with the current risk assessment.

If a launch operator licence is granted (i.e. an operator licence which includes launching a launch vehicle), then the operator is subject to these safety regulations.

If a return operator licence is granted (i.e. a licence which is not a launch operator licence and which authorises the operator to operate a launch vehicle launched elsewhere than the UK in order to return it to land in the UK), then the operator is subject to those safety regulations that apply to return operators.

If the operator holds a launch operator licence or a return operator licence, then the operator is considered to be a spaceflight operator. Both of these licences are types of operator licences as defined in section 3 of the Act. Part 1, regulation 2 "interpretation" describes in detail what types of activity may be authorised for the operator's spaceflight activities under an operator licence. Regulation 2 also contains other key definitions, including those for "launch operator licence" and "launch vehicle". Spaceflight activities is defined in section 1 of the Act.

For the purposes of a launch operator licence, spaceflight activities begin at launch[19] and continue throughout the flight until return to earth if that is envisaged. For the purposes of the return operator licence the spaceflight activity that is subject to UK regulation is the activity of returning a launch vehicle to earth from orbit (i.e. a launch vehicle that was not licensed for launch from the UK and was first launched from outside the UK).

Questions

35. Is it clear to whom these safety regulations will apply? Please provide details.

36. Is it clear where a spaceflight activity will begin and end to which these safety regulations will apply? Please provide details.

"Flight" – as used in regulations for flight termination personnel (92); during launch and flight: monitoring and termination (103); additional requirement relating to the launch vehicle during operator's spaceflight activities (104); and Schedule 5, paragraph 19 in relation to the safety operation manual – means any period from the moment when the launch vehicle first moves with the intention of launching until the completion of the operator's spaceflight activities, but does not include any period after that vehicle has reached orbital velocity.

It is important to read each of the regulations carefully as their applicability is dependent on the definitions used in each regulation, where those definitions are found (e.g. regulation 2 or 81), and any specific type of operator licence that is referred to in the regulation.

Questions

37. Do you have any comments with regards to the definition of flight or the flight envelope for the purposes of regulations 92, 103, 104, or paragraph 19 of Schedule 5? Please provide details.

[19] 'Launch' is defined in the Space Industry Act 2018: http://www.legislation.gov.uk/ukpga/2018/5/section/69/enacted

Retention, review and revision of safety case and risk assessment

Chapter 3 covers the requirements relating to the retention, review and revision of safety case and risk assessment.

The requirements to retain the safety case and risk assessment are both set out in regulation 106(2)(c), with both documents to be retained for the duration of the licence. Regulation 83 ensures that these are also kept under review, with revisions made as necessary. The regulator must be informed about any review and subsequent revisions to the safety case and/or risk assessment, and a licensee will not be able implement changes to its spaceflight activities or commence any launches unless the regulator has accepted the revisions.

Questions

38. With regard to the events and matters set out in regulation 83, are there any other instances or occurrences that you think should necessitate a review and/or revision of the safety case and risk assessment? Please provide details.

Demonstrating requirements

Chapter 4 encompasses other safety requirements and describes how the remaining requirements in the safety regulations link to the safety case and risk assessment. The requirements are intended to be sufficiently general so that they can be applied by the licensee to their spaceflight activities. The spaceflight operator must demonstrate in the safety case how its spaceflight activities comply with the requirements in regulations 87 to 107 in so far as those requirements relate to the operator's spaceflight activities.

Requirements about the spaceflight operator's organisation and management and specific safety roles

The requirement relating to the spaceflight operator's organisation is set out under regulation 87. This applies during the licence, and the intention is to ensure that the spaceflight operator's organisation remains an organisation with the ability to carry out the spaceflight activities. The organisational requirements include having sufficient financial and technical resources, having a launch vehicle and sufficient operating staff, and having the necessary facilities, infrastructure and equipment.

Regulation 88 specifies that a spaceflight operator must have in place a safety management system which complies with the requirements set out in Schedule 4. The safety management system sets out lines of responsibility and accountability, and processes to ensure risk controls are effectively and consistently applied. It is a systematic and proactive approach for identifying and managing safety risks to an acceptable level.

Requirements about specific safety roles

Regulations in section 3 Chapter 4 concern the responsibilities of various personnel to be appointed by the spaceflight operator. Not all of these persons need to be appointed (e.g. they may not be prescribed roles in terms of regulation 9, or needed for the specific type of activity (such as flight termination personnel). The regulations in section 3 include the responsibilities of the safety manager, the accountable manager and where applicable, the launch director and the flight termination personnel. For example: flight termination personnel will only need to be appointed if the launch vehicle uses a flight safety system and the system is not autonomous.

Questions

39. Are there any other considerations you think should be accounted for regarding the roles of the safety manager, accountable manager, launch director or the flight termination personnel, or that guidance should address? Please provide details.

The safety operations manual

Regulation 93 sets out the requirement for a safety operations manual throughout the period of the licence. This is a document which must contain all such information, procedures and instructions as may be necessary for the operating staff to carry out their spaceflight duties safely and in accordance with the safety case. Schedule 5 contains the various matters, that as a minimum, be contained in the safety operations manual.

Preparations for launch, return and other operations

Section 5 Chapter 4 contains requirements for the preparations for launch, the return of launch vehicles not originally launched from the UK and other related operations. Regulation 94 sets out requirements for the launch vehicle to be used in the operator's spaceflight activities and how it will be ascertained that the launch vehicle is fit for those activities. The requirements are intended to cover basic matters which are capable of being applied to different types of launch vehicle, such as design and build to a technical requirements specification, that it has been sufficiently tested in relation to regulation 97 and that the technical requirements specification is suited to the operator's spaceflight activities.

The exact contents of the technical requirements specification are subject to a technical review at the present time but could include:

A. Functional requirements:

The essential functions which the launch vehicle and its ground support equipment will be expected to perform during the operator's spaceflight activities:

Orbital launch vehicle:

- ground or air launch
- expendable or reusable
- range of orbits to be attained (achievable orbital parameters at which satellites can be deployed?)
- ability to transfer between orbits
- whether capable of controlled re-entry from orbit and recovery intact to earth
- range of payloads to be carried including:

    - minimum and maximum allowable total mass of all payload capacity

    - number of individual payloads allowable within the total mass allocation for payloads

- limitations related to toxic or hazardous materials on board the payload (e.g. to carry nuclear-powered)

- limitations related to the space environmental conditions that the launch vehicle or on board payload can be exposed to without causing damage.

Suborbital launch vehicle:

- guided or unguided or piloted
- ground or air launch
- expendable or reusable
- minimum and maximum achievable altitudes
- transmission of data during flight
- recovery of intact payload
- as necessary, functional requirements related to carrying human occupants safely (on board environment, equipment, number of crew etc, means of recovering safely to earth).

Ground-support equipment used for:

- supplying electrical, hydraulic or pneumatic power
- storing fluids, gases and other materials
- transferring fluids and gases
- cooling or heating fluids, gases and other materials
- changing or maintaining the pressure of fluids, gases and other materials
- detecting the properties of fluids, gases and other materials (e.g. temp, pressure etc.)
- supporting loads related to the launch vehicle prior to launch or when transporting the launch vehicle
- providing means of communication for the operator

B. Mission requirements

Requirements for a specific, individual mission (single spaceflight), including:

- vehicle launch site(s)
- specific trajectory
- actual payloads to be transported by the vehicle (mass/type)
- orbits to be reached by the launch vehicle (in order deploy each payload)
- method of disposal of the launch vehicle or parts of the launch vehicle
- requirements related to recovery of the launch vehicle (if needed)

- number and role of human occupants (if any).

C. Interface requirements

Requirements for interconnecting systems, equipment and devices between the launch vehicle and the:

- payloads carried on board
- ground support equipment.

D. Environmental conditions requirements

Requirements related to the exterior and interior environmental conditions that the launch vehicle and its ground support equipment must be capable of withstanding, whether or not such environmental conditions naturally arise or arise from the operation of the launch vehicle during the operator's spaceflight activities, including the following conditions:

- thermal (temperature, heat transfer)
- forces due to acceleration
- electromagnetic
- exposure to ionizing radiation
- atmospheric pressure and humidity
- meteorological
- vehicle tolerance to space-debris and micrometeoroid impact.

E. Operational requirements

Requirements relating to the services that the operator, spaceport, range control service or other participating organisation will need to supply so that the launch vehicle can be safely operated and perform its functions and the individual mission. Such services include:

- range control services
- services provided by the spaceport
- air traffic services
- arrangements for airspace utilization (e.g. via CAA)
- emergency services
- services related to keeping any location clear of persons or restricting the movement of persons (police, traffic etc.)

Questions

40. Is a technical requirements specification a suitable basis for the spaceflight operator to present the essential requirements of the launch vehicle and ground support equipment? Please provide details.

41. If you answered no, please say which document(s) should be referred to or might be used instead of a technical requirements specification.

Regulation 95 takes account of the launch vehicle's ground support equipment – ensuring that it is also fit for supporting the operator's spaceflight activities. Where a launch vehicle is to be reused (i.e. has been used in one or more flights), regulation 96 ensures that the spaceflight operator must carry out maintenance, servicing and repair on that vehicles and record the work that has been done on it to return it to service.

Regulation 97 requires that before a launch, the spaceflight operator must verify by testing, analysis, review of design of the launch vehicle and the ground support equipment and inspection that the launch vehicle and its ground support equipment is fit for the operator's spaceflight activities and that the results of the verification tests have been recorded.

Questions

42. Do you agree that regulation 97 allows for an appropriate verification and validation approach to be taken in relation to a spaceflight activity? Please provide details.

43. Pre-launch preparation of the launch vehicle and spaceport involves a number of activities, from maintenance of the infrastructure to loading of propellant onto the launch vehicle and/or satellite. How do you foresee these responsibilities being split between the launch operator and spaceport licensees? Please provide details

44. How do you foresee the safety responsibilities for pre-launch activities being reflected in the respective safety cases for launch operator and spaceport licensees? Please provide details.

Although separate regulations have been drafted for spaceport safety and range control services, regulation 98 likewise places a requirement on the spaceflight operator to ensure that the spaceport and range to be used are fit for the operator's spaceflight activities. In this context "fit for the operator's spaceflight activities" means that that the spaceport and range are both suitable for carrying out the activities safely and that the licensees are authorised to carry out their function.

Regulation 99 ensures that there are reliable means of communication with various entities during the operator's spaceflight activities, in so far as necessary to carry out the specific activity safely. Under regulation 100 the spaceflight operator must also monitor and take account of environmental and meteorological conditions during the spaceflight activities to ensure that these conditions will not adversely affect the mission.

Unless it is permitted by the licence, regulation 101 restricts dangerous goods being carried or loaded on a launch vehicle, including placing, suspending or carriage of such goods beneath launch vehicle. "Dangerous goods" means any article or substance that is identified as such in the 2019-2020 English language edition of the Technical Instructions for the Safe Transport of Dangerous Goods by Air, approved and published by decision of the Council of the International Civil Aviation Authority but does not include propellants or other substances necessary for the normal functioning of the launch vehicle.

Launch, return and other operations

Regulation 102 in section 6 contains safety requirements concerning the conditions that must be met before commencing the spaceflight activity with a launch or, in the case where the launch vehicle was launched from outside the UK, beginning a return re-entry from orbit.

Following on from a launch, regulation 103 requires that a launch operator must monitor the launch and flight in real-time so that the operator is aware as soon as the vehicle malfunctions. In the case of a malfunction, flight termination personnel must make a flight termination decision if the malfunction prevents the flight from being carried out safely. In this context "flight" means any period from the moment when the launch vehicle first moves with the intention of launching until the completion of the operator's spaceflight activities but does not include any period after that vehicle has reached orbital velocity.

Questions

45. Regulation 102 details the conditions for commencing the spaceflight activities ranging from the need to confirm that the launch vehicle is fit for operator's activities to the procedures for launch authorisation. Do you have any comments on the conditions for commencing the operator's spaceflight activities? Please provide details.

46. Concerning regulation 103 (during flight: monitoring and termination) do you think it is reasonable to require a launch operator to monitor the launch and flight of their vehicle in real-time so as to be aware of a vehicle malfunction? Please provide details.

47. Should the requirement be for the monitoring to be done only if necessary to carry out the spaceflight activity safely (e.g. the operator sets out in the safety case why such monitoring might not be necessary)? Please provide details.

48. Do you envisage any additional duties/responsibilities of the flight termination personnel? Please provide details.

Flight termination personnel do not need to make a flight termination system if an automated flight safety system is installed in the vehicle which can make such a decision.

Regulation 104 contains additional requirements related to various things that must be done and reasonable steps that must be taken on-orbit (if the vehicle is capable of reaching orbit). If the spaceflight operator is able to control how the launch vehicle functions during the spaceflight activities the operator must continue to monitor the trajectory of that vehicle, in so far as it is possible to do so. If the vehicle is in orbit, the operator must monitor the basic orbital parameters of that vehicle and take all reasonable steps to ensure that the vehicle does not interfere with the space activities of other persons; to limit or prevent major accident hazards from occurring; and to prevent any contamination of outer space.

Where the operator's spaceflight activities relate to the launch vehicle returning to earth, the operator must cause its vehicle to re-enter the earth's atmosphere on a planned trajectory and take any other action necessary to carry out the spaceflight activity safely (i.e. in accordance with the safety case and any conditions on the licence).

Questions

49. Do you think it is likely that a launch vehicle returning from orbit will need a flight safety system and therefore might also need monitoring for the purpose of detecting malfunctions so that flight termination personnel may take action to safely terminate the flight (assuming there is no automatic flight safety system installed in the launch vehicle)? Please provide details.

50. Referring to the sequential mission phases covered by regulations 102, 103 and 104 and the guidance provided, is the intent and purpose of these regulations clear? Please provide details.

51. Regulation 104 and Schedule 1 identify a number of requirements for parts of the launch vehicle that reach orbit or for any sub-orbital launches that interfere with the space environment. These seek to minimise the interference of the spaceflight activity with other space objects and ensure the operator considers aspects such as space debris mitigation in their mission. Do you have any comments about the requirements relating to the launch vehicle during operator's spaceflight activities? Please provide details.

52. Do you understand the link between these regulations and the spaceflight operator's safety duty set out at regulation 82, in as far as the regulations refer to the operator's spaceflight activities being carried out safely? Please provide details.

Recording, retaining and preserving information for safety purposes

Section 7 is concerned with requirements relating to making, retaining and preserving information, communications and other data at various times and for various listed purposes. These purposes include maintaining and improving the operator's safety performance, to enable the regulator to perform its duties and to assist in accident investigations or to make an occurrence report.

Emergency response

Section 8 contains a single requirement for the operator to have an emergency response plan and sets out the key matters this plan must contain or provide for. The emergency response plan must be tested at suitable intervals not exceeding three years and reviewed and revised as necessary.

Additional safety requirements for launch vehicles with human occupants

Section 2 of Chapter 5 sets out the additional safety requirements for the crew of launch vehicles including ensuring that each member of the crew has clearly defined roles and duties; circumstances when a crew member must not perform a spaceflight due to their physical condition; information about the flight that the operator must make available to the crew and the authority of the pilot in command.

We intend to add requirements relating to the danger arising from cosmic radiation in relation to exposure incurred or liable to be incurred by crew of a launch vehicle while performing their duties. These requirements will be modelled on the relevant provisions from the Air Navigation (Cosmic Radiation: Protection of Air Crew and Space Crew and Consequential Amendments)

Order 2019[20]. This order was made on 10th July 2019 and came into force on 7th August 2019 and is already a legal obligation in respect of spaceflight activities.

Regulation 113 of Section 3 of Chapter 5 sets out additional system requirements which are necessary if human occupants are on board. These system requirements relate to systems essential for sustaining life and consciousness, including oxygen, pressurisation, detecting smoke, restraining occupants in their seats and warning of ice.

Regulations 114-117 concern requirements for determining the number of human occupants on board; accessibility of instruments and equipment; emergency equipment and maintaining adequate atmospheric conditions in inhabited areas of the launch vehicle.

Specific obligations of pilot in command, flight crew or remote pilot, and spaceflight participants

Regulations at Section 4 of Chapter 5 set out the obligations of the pilot in command, flight crew or remote pilot. This encompasses requirements for a pilot in command or a remote pilot to perform, where suitable, an inspection of the launch vehicle and its systems prior to launch; for a pilot in command or a remote pilot must give commands, make appropriate decisions and take appropriate actions during the spaceflight; for the flight crew to remain at their stations and be secured in their seat in certain circumstances, and obligations to a spaceflight participant about remaining at their assigned station.

Spaceflight participants and information to be given to a human occupant after the consent form is signed

Regulations at Section 5 and 6 relate to provisions for spaceflight participants including a prohibition if the launch vehicle is not fit for use, remaining secured at an assigned station, availability of seating and receiving information about the operator's spaceflight activities after the consent form has been signed (i.e. updated information which is relevant and has become available in the time period between signifying consent and taking part in the operator's spaceflight activities.

Chapter 6 contains the contraventions and sanctions (penalties) which relate to the safety regulations previously described.

Questions

53. In the Regulations the scope of activities considered under the return operator licence are outlined. Do you have any comments about the type of activities envisaged under the return operator licence? Please provide details

54. Are there any other considerations associated with the safety of the operator's spaceflight activities that the launch operator licence or the return operator licence regulations or associated guidance should address? Please provide details.

[20]The Air Navigation (Cosmic Radiation: Protection of Air Crew and Space Crew and Consequential Amendments) Order 2019: http://www.legislation.gov.uk/uksi/2019/1115/contents/made

Part 9: Spaceport safety

Part 9 of the Regulations covers spaceport safety. This Part places controls and requirements on a spaceport licensee regarding how spaceport operations are conducted. More information will also be available in the draft spaceport licence guidance.

Spaceport safety requirements are based on the identification of hazards, an assessment of the risks and controlling risk to 'as low as reasonably practicable' (ALARP)[21].

The spaceport safety regulations are informed by the UK's current regulatory framework for civil aviation and best practice championed by the Health and Safety Executive, as used across other high-risk industries in the UK such as oil and gas and nuclear.

The draft regulations apply to any aspect of spaceport operations during all phases of pre and post spaceflight operations.

The proposed regulations do not overwrite existing health and safety or other legislation applicable to spaceport operations, for example regarding the storage and handling of propellants. The Health and Safety at Work etc Act 1974 and the regulations made under it will continue to apply where there is work activity.

Unless specified, the regulations do not differentiate between the different types of spaceports, such as horizontal, vertical or balloon launch facilities.

A spaceport licensee will be assessed by the regulator on an ongoing basis to ensure they are complying with the safety requirements (see Part 13 Monitoring and enforcement).

Chapter 1 of the spaceport safety regulations sets out definitions used in the Part.

Chapter 2 places a duty on the spaceport licensee to ensure that its activities are carried out safely. This is in line with legislation for high risk industries in the UK where a permissioning[22] regime has been established. It means that in the case of a spaceport licensee, that licensee is responsible for ensuring risks to the public from their operations are managed to ALARP, in line with the safety case that they will submit and maintain, and that they are responsible for complying with the Space Industry Act 2018, these safety regulations and any conditions attached to their licence.

Horizontal spaceport location requirement

Regulation 141 in Chapter 3 imposes an ongoing requirement that horizontal spaceports are located at either a European Aviation Safety Agency (EASA) certified aerodrome or an aerodrome licensed under an Air Navigation Order.

Safety case retention and review

Chapter 4 provides for the retention, review and revision of the spaceport licensee's safety case. The intent is to ensure that the safety case is a living document that reflects an up-to-date picture of the spaceport operations, hazards risks and mitigations.

[21] The ALARP principle involves weighing a risk against the trouble, time and money needed to control it. Thus, ALARP describes the level to which the regulator will expect to see risks controlled

[22] http://www.hse.gov.uk/enforce/permissioning-licensing.htm

Regulation 143 sets out requirements on the spaceport licensee regarding review and revision of the safety case.

Paragraph 1 requires the spaceport licensee to review and, where necessary, revise the safety case no later than five years after the safety case was last sent to the regulator or, where it was not required to be sent to the regulator because it was reviewed but not revised, five years after it was last reviewed by the spaceport licensee.

Paragraph 1 sets a maximum period before the spaceport licensee must review or review and revise its safety case. Paragraph 2 sets out circumstances that trigger earlier review and, where necessary, revision. These include:

- before making changes to licensed activities carried out at the spaceport (if such changes could have significant consequences for risk) if new activities are introduced to the site
- before introducing new hazardous materials to the spaceport (where their introduction could have significant consequences for risk) if new hazardous materials are introduced to the site
- following an accident or occurrence at the spaceport
- following an accident or occurrence elsewhere that may be of relevance to their operations (for example, an accident involving a launch operator that also operates from their spaceport)

Regulation 144 requires the spaceport licensee to send a revised safety case to the regulator along with any other information about the revised safety case that the regulator requires. The spaceport licensee must also inform the regulator where it has reviewed its safety case but there is no revision to the safety case.

Paragraph 3 requires that the spaceport licensee must not implement any changes to its licensed activities before the regulator has accepted the revised safety case in writing.

Questions

55. Do you think the maximum period of five years in paragraph 1 of regulation 143 is a suitable interval between reviews (and, where necessary, revision) of the safety case? If you answered no, what do you think would be a suitable interval? Please provide details.

56. Are there any circumstances not already covered in paragraph 2 of regulation 143 that you think would result in a review of the safety case? Please provide details.

Safety clear zones

Regulation 145 requires a spaceport licensee to put in place the safety clear zones determined by the assessments made in its safety case. Paragraph 3 requires the spaceport licensee to promulgate the times when the safety clear zone is active and the area its covers, ensure that it is monitored and that no one is inside it, except where their presence there is essential to carry out the spaceflight activities or duties connected with that activity.

Hazardous materials, testing areas and safety equipment

Chapter 6 sets out the requirements regarding hazardous materials, testing areas and safety equipment at spaceports.

Operator licensees may require various propellent and other hazardous materials to be located at spaceports. These could be in a solid, liquid or gaseous state. Each type of propellent or other hazardous material may have different characteristics and requirements either in isolation or when combined in close proximity on a spacecraft or carrier aircraft.

The purpose of Chapter 6 is to enable the spaceport licensee to manage and demonstrate to the regulator that the risks associated with the transportation, storage, handling and loading or unloading of propellent and any other hazardous materials that may be harmful have been mitigated as far as reasonably practicable. For example, the introduction of oxidisers alongside fuel will require careful management to avoid the risk of explosion.

The term “hazardous materials” was chosen over “hazardous substances” because it is the term that is used in the Space Industry Act 2018, although it is not defined in the Act. It is defined in Part 1 of the Regulations as “any fuel or oxidiser, radioactive material or any substance or material prescribed as a hazardous substance for the purposes of the Planning (Hazardous Substances) Act 1990, the Planning (Hazardous Substances) (Scotland) Act 1997 or the Planning Act (Northern Ireland) 2011 or by regulations made under those Acts”. It encompasses radioactive material, which may be present in small quantities in satellite payloads. Spaceports may require hazardous substance consent depending on the quantity of hazardous material they are planning to store on site.

Regulation 146 requires the spaceport licensee to designate the areas on the spaceport site where fuels, oxidisers and hazardous materials will be stored. It also requires the licensee to submit a site plan showing these designated storage areas, the maximum quantities to be stored, the hazard types (if applicable) and minimum and actual separation distances as established in the spaceport licensee’s safety case. This regulation covers static facilities. The site plan required under paragraph 3 must be integrated with the plan required under regulation 39 (4)(d) (safety case requirement). This is to ensure that the regulator receives one site plan, which makes all hazards clear in one place and which the regulator can assess holistically.

Regulation 147 covers loading, unloading, fuelling and venting areas for fuels, oxidisers and other hazardous materials. This regulation requires the spaceport licensee to designate areas on site where these activities can be undertaken safely. This is separate from the requirement at regulation 146, because these activities are not static and may not always be able to be shown to take place in the same location on a site plan. Appropriate areas will be determined in the spaceport licensee’s safety case.

The risks associated with the loading or unloading of propellants will depend on the fuels, oxidisers and any other hazardous materials being used. For example, some fuels are almost inert in their basic state while others could be extremely hazardous. The actual requirements for propellant loading, unloading and venting areas and the processes and procedures required will therefore vary considerably and will be determined by the spaceport licensee’s safety case.

The use of some oxidisers, such as liquid oxygen, pose an additional risk if they are spilled on asphalt. The spaceport licensee should ensure that the surfaces of propellant loading and

unloading areas are compatible with the substances being used. Processes and procedures must be in place to minimise the risk posed by spills and contamination.

Regulation 148 aims to ensure that fuels, oxidisers and other hazardous materials stored at spaceports are fit for use in carrier aircraft (as defined), launch vehicles, satellites or other payloads. The provisions are based on Air Navigation Order 2016[23] Article 220, with modifications.

The purpose of this requirement is to ensure that where a spaceport licensee is responsible for the storage of these items, they are stored in a way that does not compromise the quality of the substance, and therefore does not have an impact on its use for spaceflight activities. There is a similar provision for aircraft fuel in civil aviation regulations. This applies only where the spaceport licensee is responsible for storing, transporting or handling fuel, oxidiser or other hazardous materials on a spaceport site and does not apply to any of these substances or materials that are moved between vehicles operated by the same operator, where the spaceport licensee will not have been involved in storage or handling of the relevant fuel, oxidiser or material.

Regulation 149 covers static engine test areas. The requirements extend to “any other test of carrier aircraft, launch vehicles or satellites or other payloads” which potentially pose a risk to members of the public”. It is not possible to predict all types of tests that may be carried out at spaceports, therefore some flexibility is required in the regulator’s powers to ensure that any test that potentially poses a risk to third parties is conducted from a designated area.

Regulation 150 sets out requirements for the maintenance and testing of safety equipment. Where a system or equipment is required without which there would be a risk to third parties or property, the system or equipment should be tested on a regular basis. The frequency of a testing regime would depend on the nature of the system or piece of equipment.

Organisation and management

Chapter 7 sets requirements about the spaceport licensee’s organisation and management.

Regulation 151 requires the spaceport licensee to have in place a safety management system which complies with the requirements set out in Schedule 6. The provisions in regulation 151 and associated Schedule are based on an amalgamation of EASA “Easy access rules for aerodromes”[24] and CAP 795[25]. The safety management system sets out lines of responsibility and accountability, and processes to ensure risk controls are effectively and consistently applied. It will form part of the spaceport licensee’s safety case.

A safety management system is a systematic and proactive approach for identifying and managing safety risks to an acceptable level. As with all management systems, it includes goal setting, planning and measuring performance. An effective safety management system is woven into the culture of an organisation. The accountable manager is responsible for the implementation and continuing compliance of the system. However, safety is a shared responsibility across the organisation and needs the involvement of all staff.

At horizontal spaceports, the spaceport safety management system may be part of or an extension to the aerodrome operator’s system. In cases where the spaceport licensee and aerodrome operator are the same entity, the safety management system that the aerodrome

[23] http://www.legislation.gov.uk/uksi/2016/765/contents/made

operator has as part of their aerodrome regulatory requirements could fulfil the obligation to have a safety management system as part of the spaceport regulatory requirements. The system would need to be reviewed and amended to fully incorporate the spaceflight activities and spaceport's licensed activities. Where the spaceport licensee is a separate entity, they will have to demonstrate to the regulator that they have a safety management system in place and that it is integrated with the aerodrome operator's system.

Regulation 152 requires spaceport licensees to have in place a spaceport manual which contains all the relevant information to describe the management and operational structure, and, as a minimum, cover all the matters specified in Schedule 7. The requirement is based on Article 212 of, and Schedule 12 to, the Air Navigation Order 2016, which sets out the requirements for the aerodrome manual within the licensing process.

The spaceport manual is the means by which all spaceport operating staff are fully informed as to their duties and responsibilities with regard to safety. It describes the spaceport services and facilities, all operating procedures, and any restrictions in place. The spaceport licensee is responsible for developing and maintaining the spaceport manual and ensuring it is up to date. The spaceport licensee must also issue a copy of, or relevant parts of, the spaceport manual to the spaceport's operating staff – including any revisions.

The spaceport licensee is expected to keep a record of who has a copy of the manual. When amendments are required, these must be made by adding further pages, or replacing existing pages in all copies. A record should be made on a dedicated amendment page at the front of each copy, showing the amendment numbers, date of incorporation, signature of the persons amending and the page or paragraph affected.

Paragraph 1 allows horizontal spaceports to annex the spaceport manual to the existing aerodrome manual.

Paragraph 3 requires the spaceport licensee to supply any amendments or additions to the manual to the regulator.

Emergencies

A key aspect of spaceport safety is planning for what happens in the event of an emergency.

Regulation 153 requires that spaceport licensees must have and maintain a proportionate emergency response plan. This is similar to the requirement on aerodromes in regulation 12(6) of the COMAH 2015 regulations[26]. This approach is appropriate for all types of spaceport site, whether accommodating vertical, horizontal or balloon launch activities. Paragraph 3 requires the testing and, where appropriate, revision of the plan at intervals not exceeding three years.

Questions

57. Is three years a suitable interval between emergency response plan testing? If you answered no, what do you think would be a suitable interval? Please provide details.

[26] The Control of Major Accident Hazards Regulations 2015
http://www.legislation.gov.uk/uksi/2015/483/contents/made

Regulation 154 requires the spaceport licensee to ensure the timely provision of rescue and firefighting provision at the spaceport. The level, type and timeliness of such provision will be determined the spaceport licensee's safety case.

Regulation 155 contains powers for spaceport-based firefighters in an emergency. Regulation 155 is closely modelled on Article 217 of the Air Navigation Order 2016[27], which aligned the powers of fire crews operating at licensed aerodromes in the UK with those employed by a local authority. This provision is designed to ensure any members of the Rescue and Fire Fighting Service at a spaceport have the same powers of entry in relation to spacecraft as the Air Navigation Order provides in relation to aircraft.

Questions

58. Are there any other considerations you think the spaceport safety regulations or associated guidance should address? Please provide details.

Part 10: Security

Appropriate and proportionate levels of security are essential to the success of spaceflight and associated activities in the UK. Security plays a key role in protecting businesses, the people who work for them and the general public. It is also important that the UK meets its international obligations in protecting information and assets used in spaceflight and associated activities. Information and assets used in spaceflight may contain sensitive technology. Launch technology, in particular, can be used for destructive purposes in the wrong hands.

Regulations covering security are set out in Part 10 of the Regulations. The proposed regulations establish minimum security standards to prevent acts of unlawful interference with spaceflight and associated activities. The security regulations are cross-cutting and will apply to all licence types: operator licences, spaceport licences and range control licences. However, not every regulation will apply to all licence types.

The draft regulations cover the three recognised aspects of security: physical, personnel and cyber. They also cover clearance, vetting and security training and qualifications of licensees' staff. Further regulations address specific requirements for the protection of US technology at a space site. Regulations also set out what is required in the event of a space site or operation being declared as Critical National Infrastructure, or an Operator of Essential Services (examples are set out further below).

The regulations are outcome-focused and the methods licensees employ to comply with the regulations should be appropriate and proportionate to the licensed activity.

At the licence application stage, applicants are required to submit a wide range of information under Sections 8(5), (6) and (7)[28] of the Space Industry Act 2018, which will include a draft of how security of the proposed operation will be undertaken, in the form of a security programme, when they are required to have a security manager. Applicants should work with the regulator during this stage to address any potential gaps in security.

27 http://www.legislation.gov.uk/uksi/2016/765/contents/made
28 http://www.legislation.gov.uk/ukpga/2018/5/section/8/enacted

Where a regulation says that it doesn't apply at a National Aviation Security Programme (NASP)[29] directed aerodrome, NASP requirements will still apply. All horizontal spaceports will either already be at directed aerodromes, or they will have to become directed.

The effect of this requirement is that the regulator may only grant a licence for a horizontal spaceport once it is satisfied that that the aerodrome at which the spaceport is sited is subject to the direction of the Secretary of State under the Aviation Security Act 1982.[30]

Regulation 156 sets out definitions that are specific to this Part. For the purposes of this Part "spaceflight operations" means spaceflight activities, range control services, activities associated with spaceflight activities and range control services and activities associated with spacecraft and their payloads. "Spaceflight participant" means an individual, other than a member of the crew, who is to be carried on board a launch vehicle with the spaceflight operator's permission. So, for example, this would include an individual taking part in a space tourism flight. It would also include individuals taking part in a spaceflight to conduct research, tests and experiments or fulfil any other function not directly related to safely operating the spacecraft.

Physical and personnel security

Chapter 2 of the draft security regulations covers physical and personnel security measures. Regulation 157 sets out the responsibilities of the security manager. Some licensees are required to have a security manager, as set out in the regulations on Eligibility Criteria and Prescribed Roles, at Part 3 of the draft Space Industry Regulations. Spaceport, range control and launch operators must all have a security manager. Operators who operate a non-launch vehicle space object (e.g. a satellite payload) in orbit must have a security manager where the licensed activities may give rise to any issues of national security. For example, the licensee's activities may give rise to issues of national security where classified information is involved, rendering the role of security manager relevant to the licensed activities. Return operators may also be required to have a security manager should their activities give rise to issues of national security.

Where a role is not prescribed under the draft Regulations but the regulator nonetheless believes a role should be undertaken given the particular nature of the licensed activities, it could still impose such a requirement via a licence condition. Where this is the case, the security manager should be considered as a prescribed role for a licensee. They will therefore be required to comply with the regulations outlining the responsibilities of the security manager. If a security manager is not a prescribed role for an operator, the operator may still wish to employ one.

However, where the security manager is not a prescribed role for a licensee, they will not be required to comply with the regulations where it is specified that the security manager is responsible for these. The policy intent is to create minimum security requirements that are appropriate and proportionate to the licensed activities. A launch operator that carries out launch activities or an orbital operator licensee carrying out activities that give rise to any issues of national security will have different security needs from, for example, a CubeSat[31] orbital operator licensee based at a university. Where it is a prescribed role, appointment of the security manager must be in accordance with Part 3 (prescribed roles) of the draft Regulations.

[29] The UK's National Aviation Security Programme is made up of all relevant EU and domestic legislation detailing aviation security requirements in the United Kingdom.
[30] http://www.legislation.gov.uk/ukpga/1982/36/contents
[31] https://www.nasa.gov/mission_pages/cubesats/overview

Regulation 158 sets out that where there is a requirement to appoint a security manager for a space site,[32] the security manager must draw up and maintain an appropriate and proportionate space site security programme, which is based on a security risk assessment, in respect of the spaceport, range control site or mission management facility (where applicable) for which they are responsible. In the case of horizontal spaceports this may be produced as an annex to the existing aerodrome site security plan. The space site security programme must be reviewed annually and sent to the regulator.

Regulation 159 sets out that where there is a requirement to appoint a security manager for an operator, the security manager must draw up and maintain an appropriate and proportionate operator security programme, which is based on a security risk assessment to spaceflight activities in respect of which they are responsible. This regulation would apply to launch operators, and (where applicable), return operators or operators who operate a non-launch vehicle space object. The operator security programme must be integrated with the space site security programme. The intent is to ensure an integrated approach to security across licensed activities. The operator security programme must be reviewed annually and sent to the regulator.

Regulations 160 to 161 cover access control to space sites. Licensees must take sufficient security measures to ensure that the space site for which they are responsible is secure from unauthorised access, which may include a physical barrier around the site. Regulation 160 does not apply to a spaceport located at a NASP directed aerodrome (see Part 5, Chapter 2 on horizontal spaceport location requirement in the draft grant of a spaceport licence regulations). Regulation 161 sets out who is authorised to access a space site.

Regulation 162 covers space site security restricted and controlled areas. Space site restricted areas are areas at space sites designated for assembling and integration of spacecraft or carrier aircraft, mating of spacecraft or carrier aircraft to their payloads, and mission management or range control services where such activities require restricted access. Any area proposed by the licensee as a restricted area must be designated by the Secretary of State for such purposes.

Controlled areas are restricted areas where US technology, data and equipment is being used and US launch activity is taking place on the site. Definitions for US technology, data and equipment and US launch activity have the meanings given in the Agreement negotiated between the Government of the United States of America and the Government of the United Kingdom of Great Britain and Northern Ireland on technology safeguards associated with United States' participation in space launches from the United Kingdom.

The provisions covering restricted and controlled areas include requirements around access control, the wearing of identification badges and appropriate screening so that prohibited articles (see regulation 164) do not enter the area. It may not be possible to screen some equipment entering restricted and controlled areas. Screening could contaminate spacecraft that have been assembled in clean rooms or damage sensitive instruments. In such cases the operator licensee must ensure that it obtains a declaration from the individual seeking to bring payloads or rockets into the restricted or controlled area confirming that they have been protected from unauthorised interference or tampering during manufacture and transportation.

Regulation 163 provides for the emergency services to be granted access to space sites without being subject to the access control measures in regulations 160 and 161. The intent is to enable rapid response time in the event of an accident or emergency. Licensees must set

[32] Space site has the meaning given in paragraph 5(3) of Schedule 4 of the Space Industry Act 2018

out a plan for action to be taken following an emergency response at the site. This plan must be included in the space site security programme, if the licensee is required to have one.

Regulation 164 sets out requirements around security controls for prohibited articles. The security controls must be set out in the space site security programme, if the licensee is required to have one. The list of prohibited articles differs for spaceflight participants and non-spaceflight participants. A spaceflight participant is an individual who is to be carried on board a spacecraft, but is unlikely to be an employee of the launch operator. As such, it is important to ensure that such individuals are not able to carry on to the site and on board the spacecraft articles that could cause injury or threaten the safety of the spacecraft. Regulation 164 does not apply to a space site located at a NASP directed aerodrome, which will be subject to the existing NASP security framework on preventing prohibited articles from entering security restricted areas of an aerodrome.

Regulation 165 sets out requirements around security controls for supplies entering space sites. These should be appropriate and proportionate to the licensed activity. Supplies in this context are generally accepted as meaning anything domestic related, anything saleable or other equipment required to facilitate the spaceflight activity on the ground. There must be procedures in place to enable supplies entering the site to be inspected and screened. These must be set out in the site security programme, if the licensee is required to have one. Regulation 165 does not apply to a space site located at a NASP directed aerodrome, which will be subject to the existing NASP regulations on supplies entering airside and into secure areas.

Regulation 166 sets out the requirements around security controls for payloads and launch vehicles entering space site security restricted areas (see regulation 162). Operator licensees must obtain a signed declaration from manufacturers of payloads and rockets and persons responsible for transporting them to the spaceport confirming that all reasonable steps have been taken to ensure their security. The operator licensee retains the final authority to allow any payloads and rockets to enter the restricted area and must notify the spaceport licensee of its assurance of the security controls applied prior to entry of the payloads or rockets to the restricted area. Any security requirements or restrictions for handling payloads and rockets must be set out in the site security programme and the operator security programme, if the licensee is required to have one.

Regulation 167 covers approval of suppliers. The intention is to set out the procedure that a licensee must follow before granting approval to a person seeking to be a supplier to the space site. In this regulation “supplier” means a person who provides all items intended to be used, sold or made available for any purpose or activity on the space site.

Regulation 168 sets out requirements on licensees around surveillance of the space sites in respect of which they are responsible. The frequency and means of undertaking surveillance must be based on a security risk assessment conducted by the site security manager, if the licensee is required to have one, or by the licence holder, if they do not have a security manager, in a manner of their choosing. The surveillance to be carried out on the site must be appropriate and proportionate to the spaceflight operations being conducted on the site. This regulation does not apply to a spaceport located at a NASP directed aerodrome, which will be subject to existing NASP requirements on surveillance and patrols.

Regulation 169 sets out security control requirements for hazardous materials. This is separate from the safety requirements for hazardous materials, which is dealt with in regulations covering spaceport safety at Part 9, Chapter 6, and grant of a spaceport licence requirements at Part 5, Chapter 2 of the Regulations. Regulation 169 applies to radioactive or other

hazardous materials at a spaceport or at locations outside the boundaries of a spaceport, for example if fuels, oxidisers and other hazardous materials are stored at a facility beyond the spaceport's boundaries. Special consideration must be given to any statutory or contractual prohibitions, restrictions or conditions that apply to the materials. Materials must be secured and protected in an appropriate manner as set out in the security programme for the space site.

Regulation 170 covers protection of carrier aircraft, launch vehicles or payloads at a spaceport, prior to integration. This includes balloons, as described in section 1(5) of the Space Industry Act 2018. The intent is to ensure such craft are protected from unauthorised access or interference at a spaceport, while also ensuring compliance with any applicable international obligations of the United Kingdom relating to security of the carrier aircraft or spacecraft. The regulation applies regardless of where the craft is parked or kept at the spaceport. Licensees must also comply with any applicable requirements relating to a NASP directed aerodrome.

Protection of carrier aircraft, spacecraft or payloads at a spaceport post-integration is covered in regulation 171. Once payloads have been integrated with launch vehicles and carrier aircraft, the spaceflight operator licensee will be responsible for maintaining security of the craft.

Regulation 172 covers security controls for flight safety systems. "Flight safety system" means a system, including all hardware and software, that provides a controlled means of ending the flight of a launch vehicle for the purposes of ensuring that the operator's spaceflight activities are carried out safely. A flight safety system might be used, for example, to prevent a launch vehicle from reaching a populated area in the event of vehicle failure by way of a controlled termination of the vehicle. As such, the security of the system is crucial. The operator licensee must ensure that appropriate security controls are applied to flight safety systems, in accordance with regulation 172.

Cyber security

Chapter 3 of the draft security regulations covers cyber security. Regulations 173 and 174 covers cyber security. The approach to setting cyber security requirements for licensees is based primarily on existing principles that are supported by NCSC guidelines.[33]

Regulation 173 requires a licensee to draw up and maintain a cyber security strategy for the cyber systems used in relation to spaceflight operations for which it is responsible. This regulation applies to all licence types.

The cyber security strategy must be based on a risk assessment and be appropriate and proportionate for the type of systems operated. The strategy and risk assessment must be reviewed at least annually or upon any upgrades to the system. The strategy must be sent to the regulator following annual review. Provisions in regulation 173 also relate to the security of systems managed by employees or agents of the licensee and the licensee's suppliers and their supply chain. Licensees are also expected to comply with the United Kingdom's international obligations and other relevant legislation, for example regarding the use of spectrum.[34]

[33] https://www.ncsc.gov.uk/collection/10-steps-to-cyber-security?curPage=/collection/10-steps-to-cyber-security/introduction-to-cyber-security/executive-summary

[34] Spectrum means the Ofcom led licensing process for radio waves/bands to regulate how communications satellites broadcast and receive data and what protections and restrictions are in place in relation to different types of data (e.g. TV signals, GPS, Earth Observation, telecoms etc.).

The intent is that the licensee's risk assessment shall inform what is appropriate and proportionate for the particular cyber systems in terms of cyber protection. The degree of risk may change and the systems may undergo upgrades, so it is important that the strategy is reviewed to reflect an up to date picture.

Where personal data is held on a system related to spaceflight operations, for example flight crew rosters, customer information or employee information, existing regulations, such as the Data Protection Act 2018[35] and General Data Protection Regulation,[36] will apply and the draft security regulations do not attempt to duplicate provisions in these.

Regulation 174 creates a duty on licensees to report a notifiable incident to the regulator and applies to all licence types. A notifiable incident is an event of a type having an adverse effect on the security of the network and information systems used in relation to spaceflight operations that may have a significant impact on future essential services provided by the licensee. Essential services means services that are essential for the maintenance of critical, societal or economic activities. For example, these include services in the energy sector (electricity, oil and gas); the transport sector (air, rail, water and road); healthcare (hospitals, private clinics and online settings); water (drinking water supply and distribution); and digital infrastructure.

Vetting, clearance, training and qualifications

Chapter 4 of the draft security regulations covers vetting, clearance, training and qualifications of staff with a security function at a licensee. This is separate and additional to the training, qualifications and medical fitness requirements at Part 7 of the Regulations, covering other employees of licensees.

Regulation 175 covers vetting requirements for individuals carrying out a security function. The regulation applies to security personnel associated with all licence types. The licensee is responsible for ensuring that the appropriate vetting is carried out. The security manager, if the licensee is required to have one, must have a level of security clearance which would be regarded as appropriate by the UK government for persons performing security functions in security restricted areas. This may be at least a valid counter-terrorist check clearance or higher clearance as appropriate as a condition of being engaged, or continuing to be engaged to carry out security functions. Any other individual carrying out security functions as part of their employment has a satisfactory background check (which encompasses the different types of security clearance as set out in Cabinet Office guidance[37]) as a condition of being engaged, or continuing to be engaged, to carry out security functions. This regulation does not apply to a spaceport located at a NASP directed aerodrome as these will be subject to the NASP security framework for vetting.

Regulation 176 covers training and qualifications for individuals performing security functions. If a licensee is required to have a security manager, either as a prescribed role, or as a licence condition, they must have the appropriate training and qualifications necessary to carry out their role. The regulator will need to work with licensees to develop appropriate security training syllabuses for individuals carrying out security functions at a space site, or for an operation.

If the licensee is required to have a security manager, that individual must ensure that individuals engaged to perform security related functions have the appropriate training and

35 http://www.legislation.gov.uk/ukpga/2018/12/contents/enacted
36 http://www.legislation.gov.uk/eur/2016/679/contents
37 https://www.gov.uk/government/publications/hmg-personnel-security-controls

qualifications to carry out those functions and that all staff receive general security awareness training.

Regulation 177 sets out the requirements around records relating to training and qualifications of individuals carrying out security functions. Licensees should also comply with relevant data protection laws.

Regulation 178 covers renewal of security training and applies to all licensees who are required to have a security manager. The licensee is required to ensure the security manager renews their training in accordance with the regulation. The security manager is required to ensure staff renew their training in accordance with the regulation.

Critical national infrastructure and essential services

Chapter 5 of the draft security regulations covers Critical National Infrastructure and essential services. Regulation 179 applies where the Secretary of State, in consultation with the Centre for Protection of National Infrastructure (CPNI), [38] determines that a space site is critical national infrastructure[39], or spaceflight activities are essential services.

Where this applies the licensee must take appropriate and proportionate measures to manage any risks posed to the security of the space site and spaceflight activities, and cooperate with the CPNI and the National Cyber Security Centre[40] in ensuring continuity of essential services.

The CPNI are leaders in security, providing resources, guidance and expert advice to help protect and keep businesses secure from external threats. They are available as a resource to licensees and applicants to consult on their security measures.

Security provisions for the protection of US space technology

The intent of the draft regulations covering US technology is to prevent the proliferation of US-origin sensitive technology to third parties. These regulations underpin the requirements that have been set out within the technology safeguards agreement between the UK Government and the United States Government to enable the use and secure management of sensitive US space launch and satellite technology in the UK (see International Context).

The regulations in Chapter 6 of the security Part apply to all licence types where US technology, equipment or data associated with US launch activity is present. Regulation 180 sets out requirements around segregated areas. Segregated areas are required when the licensee intends to carry out US launch activities. This is in addition to the requirement for a controlled area at regulation 162. The licensee proposes the area to be designated by the

[38] https://www.cpni.gov.uk/

[39] Critical national infrastructure is defined as:
"those critical elements of infrastructure which includes assets, facilities, systems, networks or processes and the essential workers that operate and facilitate them, the loss or compromise which could result in—major detrimental impact on the availability, integrity or delivery of essential services including those services whose integrity, if compromised, could result in significant loss of life or casualties, taking into account significant economic or social impacts, and/or significant impact on national security, national defence, or the functioning of the state."

[40] The National Cyber Security Centre was set up by the UK Government in 2016 as part of the Government Communication Headquarters to help protect critical services from cyber attacks, manage major incidents, and improve the underlying security of the UK internet through technological improvement and advice to UK citizens and organisations: https://www.ncsc.gov.uk/

Secretary of State and the US Government. The area remains designated as segregated only if there is US technology in that area.

Regulation 181 sets out the access control requirements for segregated areas. Authorisation to enter a segregated area is carried out by the US Government. A licensee must set out the access control measures for the segregated area in the site security programme, if they are required to have one. Emergency services are exempt from access control measures for a segregated area when responding to a threat to life or property.

Regulation 182 sets out requirements for the Control of access to imported US technology. This requirement applies in the case of a person or company either owning, or being in possession of US technology (or both), where that person or company must ensure that access to that US technology is controlled by a person authorised to do so by the Government of the United States of America, throughout transportation, preparation for launch, and the launch of US launch vehicles or spacecraft. It is an offence for a person or company to contravene this regulation.

Regulation 183 and 184 set out that special launch operators[41] must not prevent individuals authorised by the US Government from accessing US technology and US technical data located at a controlled or segregated area, or during launch activities.

Regulation 185 covers restrictions on access to and transfer of US technology and technical data and sets out which UK authorities may be authorised to have access to US technology and US technical data.

Regulation 186 sets out that no UK licensee may take possession of imported US technology, or allow any other UK participant to do so, without the permission of the regulator. The regulator may only give permission if the US Government and Her Majesty's Government have agreed that the UK participant may take possession.

Regulation 187 sets out the requirements around security training for spaceflight activities involving US technology. Details of the training to be received by staff carrying out such activities must be set out in the security programme, and be part of the security training syllabus for spaceflight operations. This applies to anyone who may potentially come into contact with US technology, regardless of their role.

Regulation 188 requires licensees to return any US technology to the United States or other location in accordance with the US export licence or authorisation.

Regulation 189 describes the procedures for handling US technology after a normal launch.

Regulation 190 sets out what information is required to be submitted to the regulator at application stage, by a launch operator or spaceport licence applicant where they are using US technology and non-US technology combined for spaceflight activities. Any further changes to information held by licensees should be made known to the regulator as soon as possible.

Question

59. Do you have any comments on the draft security regulations? Please provide details.

[41] Special launch operators has the meaning given in the draft Space Industry Regulations

Part 11: Informed consent

Commercial sub-orbital human spaceflight is a very new and inherently risky activity that is only now becoming a reality for the general public. There is no international consensus on the accepted boundary between Earth's atmosphere and outer space. The US Air Force and NASA define the limit to be 80 km above sea level. At these altitudes the pressure, temperature and oxygen density is too low to support human life without a pressurised cabin or specialised suit to deal with the harsh conditions. In addition, at these altitudes the atmosphere becomes too thin to support aeronautical flight, therefore to reach these altitudes it is likely that a vehicle using a chemical rocket propulsion system is needed.

The use of chemical rocket propulsion means that the spaceflight participants will be subject to high levels of acceleration that may cause adverse effects to the human body. The reliability of chemical rocket propulsion systems is also typically lower than aircraft engines due to the complexity of their design. In addition, the sub-orbital vehicles using the chemical rocket propulsion are part of a new market sector. This limited experience has meant that Regulators are yet to develop a suitable certifying regime for the airworthiness of the vehicles or agree on accepted international standards for the safety of occupants. All of these factors contribute to the risk of death or injury during a spaceflight.

While such activities bring great opportunity – for businesses and for the human occupants who take part in this exciting new space age – it is crucial that a licensee informs the human occupant who are to travel on board of the risks involved. The persons who are to fly on board will fall into one of two categories: a member of the launch vehicle crew, or a spaceflight participant who is not a crew member. Together, these individuals are referred to as "human occupants"

A member of crew is a prescribed role and a spaceflight participant is a prescribed capacity. These human occupants must understand the risks, consent to them and provide evidence of this to the licensee – a process known as informed consent. If the prospective human occupants do not give this informed consent, the licensee must not allow them to take part in the spaceflight and will be committing an offence if they do so.

Many of the requirements for the UK informed consent process have been drawn from similar US provisions about informing crew and spaceflight participants of risk. US regulations require an informed consent regime for commercial human spaceflight, whereby the operator is required to notify in writing to any individual serving as crew that the United States government has not certified any launch or re-entry vehicle as safe for carrying flight crew or spaceflight participants ("non-certification statement"). The operator is also required to provide spaceflight participants with the same non-certification statement given to crewmembers as well as notifying participants of the hazards and risks of the launch or re-entry in which they wish to participate.

The requirements regarding informed consent for the UK are set out in Part 11 of the Regulations. The launch operator licence guidance will also provide further explanation of the informed consent process.

It is important to note that safety regulations have also been made for human occupants of a launch vehicle at Part 8, Chapter 5 of the Regulations, and similarly there are training and medical fitness requirements set out at Part 7 of the Regulations.

Prescribed matters

Chapter 2 of Part 11 of the Regulations covers prescribed matters in relation to Part 11. As set out in section 17 of the Space Industry Act 2018, it is an offence for an operator licensee to allow a human occupant to take part, in a prescribed role or capacity, in spaceflight activities carried out by the licensee unless the human occupant has signified their consent to accept the risks involved in those activities and fulfils prescribed criteria with respect to age and mental capacity.

Members of ground staff and visitors to the spaceport who are not carried on board a launch vehicle are not within the scope of the informed consent regulations. The employer already has a duty under section 2 of the Health and Safety at Work etc. Act 1974[42], to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all their employees. Section 3 of that Act also places a duty on the employer to conduct their undertaking in such a way as to ensure, so far as is reasonably practicable, that persons not in their employment who may be affected thereby are not thereby exposed to risks to their health or safety. More information on health and safety at spaceports can be found in the spaceport safety section of this document.

Regulation 193 sets out the prescribed criteria with respect to age and mental capacity. Whilst the launch vehicle operator may have taken reasonable precautions for the safe conduct of a flight, the nature of the hazards and risks posed to persons on board mean that a human occupant must take on a substantial burden of personal responsibility for understanding and deciding whether or not to be exposed to those risks. Understanding the risks and being able to make a judgement about whether to accept them requires the human occupant to have an acceptable level of maturity, and the capacity to make decisions or understand or retain information relevant to that decision.

Regulation 193(2) refers to the appropriate England or Wales, Scotland, and NI legislation where the meaning of such capacity or incapacity can be derived.

For maturity and legal responsibility, the regulator has settled on the minimum age of 18 for the draft regulations.

A licensee is only concerned with capacity in terms of the decision to be given a role or to participate in the spaceflight activity and not any other reason unconnected with the licensed activity.

The consent form

Chapter 3 sets out the requirements regarding the consent form. Regulation 194 sets out what must be included in the consent form such as personal details, details of the launch vehicle to be used for the spaceflight activities and the easily understandable form of the risk assessment. The extent of further details that must be provided depends on whether it is to be signed by a crew-member or a spaceflight participant.

Regulation 195 covers statements that must be included in the consent form; these include a statement that the person signifying consent accepts and understands that the spaceflight activities carry an inherent risk of danger and in particular that the activities may result in death or injury, The person signifying consent will also be confirming that they accept and understand that the regulator has not certified that the launch vehicle complies with any national or international safety standards. Signification also confirms that the human occupant accepts

[42] https://www.legislation.gov.uk/ukpga/1974/37

that they will not have a strict liability right of claim against the licensee in the case of injury or damage resulting from the spaceflight activity (i.e. the human occupant must show the licensee is at fault). Human occupants must also signify that they accept that the power under section 35 of the Space Industry Act 2018, for the Secretary of State to indemnify a licensee or claimant in situations where damage or injury is sustained, will not apply to them.

Part 12 of this consultation document explains the subject of liabilities and indemnities in greater detail.

Signifying consent does not mean that the human occupant must take part in the spaceflight activity. A human occupant may withdraw from participating at any time prior to actually making the spaceflight. Once the spaceflight is underway, decisions on stopping the spaceflight will be made in the best interests of the safety of the flight in regard to all occupants of the launch vehicle and those uninvolved persons who may otherwise be adversely affected by the spaceflight.

Information to be given to a human occupant before the consent form is signed

Chapter 4 covers information to be given to a human occupant before a consent form is signed. Human occupants must be informed about the operator's spaceflight activities and the information provided must include any recommendations made as a result of a safety investigation and any corrective actions taken following an accident. Human occupants will also be provided with quantitative information concerning numbers of launches, the number of persons who have died, sustained an injury or had a medical emergency and the number of accidents, in relation to the operator's spaceflight activities. The aim is to give the human occupant receiving the information an idea of the quantitative risks, based on historical data, that they may be exposed to during their spaceflight.

Regulation 198 requires that the human occupant must also be given information concerning the details of the current risk assessment in an easily understandable form and the availability of emergency services in the event of an accident or medical emergency.

Safety regulation 127 requires that before the operator's spaceflight activities commence, the spaceflight operator must give each human occupant the information referred to in regulations 197 and 198 which has become available since any of these individuals signed the consent form. This includes the most up-to-date version of the risk assessment (e.g. the "current" version) although the spaceflight operator may supply the parts of the risk assessment that continue to apply and details of any changes.

The information referred to, must be given to the human occupant at least 12 hours, but not more than one month, before that occupant, as a prospective member of the crew or a prospective spaceflight participant, has an opportunity of signing the consent form. The minimum 12-hour period has been established to give each human occupant at least that length of time to examine the information and ask questions, versus being asked to do so, for example, immediately prior to a flight. If the information is extensive, the licensee has the option of providing it up to a month before to give a longer time for consideration.

Under regulation 199 the operator must give the human occupant an opportunity to ask questions about the information and the operator must answer them in an easily understandable form. Questions may be raised, and answers given, in writing or orally.

Questions

60. Regarding regulation 197, the maximum time limit of one-month has been established since information provided before that time is more likely to be out of date. The minimum period to examine the information and ask questions has been established as 12 hours. Do you agree with this approach or should some other time limits be established? Please provide details.

61. If you do not agree, what balance, in regard to these time-limits, do you see as adequate between the needs of the licensee versus the needs of the participants? Please provide details.

Procedural requirements with regard to the signification of consent

Chapter 5 sets out the procedural requirements with regard to the signification of consent. The spaceflight operator must prepare the consent form in writing and in duplicate. The human occupant must sign the consent form not more than 24 hours before taking part in spaceflight activities, i.e. the occupant can take part in the spaceflight at any time within the 24 hours after signing the consent form but will have to re-signify if the 24 hour period has been exceeded. This is to help ensure that training competency, medical requirements and the risk information will still be valid between the time of an occupant signing the consent form and then boarding the flight. The human occupant retains the original of the consent form.

Chapter 6 sets out evidential requirements with regard to the information and the signification of consent. In order to establish an evidential chain to verify that consent has been signified, the spaceflight operator must keep a written record of the information provided to the human occupant and when it was provided. The human occupant, if willing to accept the risks of undertaking the spaceflight activity, must sign and date the consent form, which may be done using an electronic signature. The signification is valid only if the spaceflight operator and the human occupant have complied with the applicable regulations as previously described and set out in Part 11.

Requirements concerning the training and medical fitness of human occupants (crew members and spaceflight participants) can be found in the training, qualifications and medical fitness section of this document.

Questions

62. Do you think the requirement for the human occupant to sign the consent form not more than 24 hours before taking part in spaceflight activities is suitable? Please provide details.

63. The draft regulations do not require a witness to the signing of the consent form. Do you agree with this approach? Please provide details.

64. Do you think the regulations and associated guidance capture everything that is needed to properly provide informed consent for spaceflight activities? Please provide details.

Part 12: Liabilities and indemnities

An important element of the Space Industry Act 2018 concerns operators' liabilities arising from their spaceflight activity.

Under the United Nations space treaties, the UK is ultimately liable for damage to the persons or property of other states caused by the space activities of its nationals or caused by such activities carried out from its facilities or territory. This means that another state suffering damage can bring a claim against the UK Government under the UN space treaties. On the ground and to aircraft in flight, the liability is absolute, which means that the state bringing the claim would not need to prove fault. In space, liability is fault-based[43].

In the UK, the UN space treaties are currently implemented by way of the Outer Space Act 1986. Space activities are licensed under this Act and operators are required to comply with conditions including the requirement that the operator indemnifies the Government for claims brought against it.

In line with the provisions in the Outer Space Act 1986, section 36 of the Space Industry Act 2018 places a liability on a person carrying out spaceflight activities to indemnify the Government or listed person or body for any claims brought against them for loss or damage caused by those activities. The bodies listed in this section are ones that may be carrying out functions on behalf of the regulator or will be appointed as a regulator.

Furthermore, in regulating spaceflight activities carried out from the UK, the Space Industry Act goes further than the Outer Space Act 1986 with regard to its liability provisions in order to provide the general public with easy recourse to compensation. As such, section 34 of the Space Industry Act 2018 places a strict liability on an operator carrying out spaceflight activities in the UK. This means that the uninvolved general public in the UK suffering injury or damage can bring a claim against an operator without having to prove fault.

This provision was included in the Act because the Government wanted to ensure that the general public suffering injury or damage in the UK are entitled to the same compensation (without having to prove fault) as foreign nationals are entitled to under the UN Liability Convention.[44] The Liability Convention provides foreign nationals with the ability (via their own Government) to seek compensation (from the UK Government as the responsible launching authority) for damage without having to prove fault (where it occurs on the ground or to aircraft in flight).[45]

This strict liability would apply to any injury or damage caused to persons (regardless of nationality) or property in the UK or its territorial waters or to an aircraft in flight or persons and property on board such an aircraft over the UK or its territorial waters. It applies to damage that is caused by a craft or space object used by the operator for spaceflight activities.

[43] UN Convention on International Liability for Damage Caused by Space Objects, Art I, II and III.
[44] UN Convention on International Liability for Damage Caused by Space Objects, opened for signature 29 March 1972, 961 UNTS 187 (in force 1 September 1972)

[45] The strict liability in the Space Industry Act 2018 applies to any person in the UK who suffers injury or damage. It therefore applies to both UK nationals and foreign nationals. Foreign nationals could choose to bring a claim against the UK Government via their own Government via the Liability Convention or bring a claim against the operator under section 34 of the Space Industry Act 2018. The operator would be liable to indemnify the UK Government for any claims brought against the UK Government by either UK nationals or foreign nationals regardless of the basis of the claim.

The definition of “spaceflight activities” in the Space Industry Act 2018 does not include the operation of spaceports or the provision of range control services. These are “associated activities”. Therefore, the Act does not impose strict liability under section 34 on persons operating spaceports or providers of range control services or require them to indemnify the Government for claims brought against it.

This is because it is considered that it is likely to be the spacecraft (launch vehicle or satellite) that would cause injury or damage to the general public. This does not however prevent anyone from bringing a claim against a person operating a spaceport or providing range control services and proving fault.

This consultation covers regulations prescribing descriptions of individuals who do not benefit from being able to make a strict liability claim under section 34(2), and prescribed cases or circumstances under which a limit, if granted, on the operator’s liability to the Government under section 12(2) would not apply.

It is our intention to publish a further consultation at a later date to seek views on the proposed approach of Her Majesty’s Government (HMG) relating to insurance requirements under section 38 of the Space Industry Act 2018.

Who does not have a strict liability right of claim?

Provisions arising from section 34(3)(a) and 36(3)(a) of the Space Industry Act 2018 can be found in Part 12 of the draft Space Industry Regulations.

Regulation 206 describes individuals who are prescribed for the purposes of section 34(3)(a) of the Act. This means that these individuals do not have a strict liability right of claim in the event of injury or damage resulting from spaceflight activities.

Strict liability means that a claimant does not need to prove fault to claim compensation in the event of injury or damage. The policy intent is that the strict liability right of claim is only available to the uninvolved general public as parties involved or actively engaged in spaceflight activities will have been made aware and consented to the risks associated with such activities (for example through signing an informed consent form). Employees of organisations involved in spaceflight activities will also have recourse to other statutory protections through health and safety legislation and employers’ liability insurance. Individuals described in regulation 206could still make a claim against an operator for injury or damage but would have to prove fault.

The persons described in regulation 206(1) (and further defined as necessary in regulation 206(2)) include:

- Appointees, employees, agents, officers, partners of licensees at a space site;
- Individuals including crew and spaceflight participants who have signalled their informed consent to take part in spaceflight activities (see Informed consent section of this document);
- Individuals on a carrier aircraft taking part in spaceflight activities;
- The emergency services, compliance authority personnel (such as the UK Security and Intelligence Agencies and CAA inspectors), space accident investigation authority (SAIA), members of the armed forces of the crown and qualifying health and safety authority on duty at a space site in connection with spaceflight activities;

- An employee or an individual acting on behalf of the regulator or with the regulator's authority at a space site;
- Individuals within an operational area or a restricted area of a space site at the invitation of a licensee;
- Individuals acting on behalf of the government of another country at a space site in connection with spaceflight activities.

Cases where a limit on an operator's liability to indemnify Government will be disapplied

By way of background, under the Outer Space Act 1986, there is a limit on an operator's liability to indemnify Government for the activities of procuring an overseas launch (purchasing space on a launch vehicle for a satellite) and the in-orbit operation of a satellite. The UK Space Agency currently limits liability for claims against Government to €60m for standard missions launching overseas.

This is the only limited liability under the Outer Space Act 1986 and it was introduced following an amendment made by the Deregulation Act 2015 46. Once the Space Industry Act 2018 comes into force, the procurement of an overseas launch and the operation of a space object by a UK entity based overseas will continue to be regulated by the Outer Space Act 1986 and benefit from a limited liability to indemnify the UK Government.

Where a UK entity procures a UK launch or operates a satellite from the UK, this will be regulated under the Space Industry Act 2018 when it comes into force. It is the Government's intention to maintain the policy on limiting the liability to indemnify the Government in licences for these activities when carried out from the UK by exercising the power under section 12(2) of the Act. This reflects the policy under the Outer Space Act 1986 that has been consulted on with industry and scrutinised by Parliament. This does not require the making of regulations and the operator's indemnity to the Government will continue to be set out in a licence condition.

Regulation 207 sets out prescribed cases or circumstances under which any limit on the operator's liability to the Government does not apply. These include:

- Cases where the operator is liable in respect of gross negligence or wilful misconduct in the performance of its obligations under the Act or regulations made under the Act;
- Circumstances where damage or loss is caused as a result of non-compliance by the operator with any licence conditions or requirements under the Act or regulations made under the Act.

Limiting liability for UK launch activities

Work is still ongoing with regard to assessing the merits of limiting the liability to indemnify Government and the liability to the uninvolved general public for launch activities taking place from the UK. As per the Government response to the call for evidence issued in May 2019[47],

[46] Deregulation Act, Section 12, 2015
http://www.legislation.gov.uk/ukpga/2015/20/section/12/enacted
[47] https://www.gov.uk/government/publications/call-for-evidence-space-industry-act-2018

the Government has commissioned further detailed and independent research, by way of a report, to inform this decision.

The report has been received and we are in the process of considering the contents and our next steps. We intend to re-engage with industry on this issue when we have a policy position. It is important to note, however, that if the Government considers that a limit on liabilities is justified, the Government would then need to assess any financial, state subsidies and other legal implications before finalising its position on liability limits.

Questions

65. Are there any other persons you think should be included in the scope of regulation 206? Please provide details.

Part 13: Monitoring and enforcement

The Space Industry Act 2018 and the draft Regulations that implement it have been formed with public safety at their heart. It is crucial, therefore, that the regulator is empowered to monitor and enforce compliance with the provisions.

Section 26 of the Act foresees the creation of inspectors for spaceflight and related activities. Inspection will be required to ensure compliance with licence requirements and spaceflight specific requirements under the Act and the draft regulations that implement it.

The draft regulations for monitoring and enforcement are informed by existing models from aviation, space and other UK enforcement regimes such as under the Energy Act 2013. The regime for enforcing the Outer Space Act 1986 has developed significantly since the legislation came into force. For example, licence conditions have since been introduced that enable the Secretary of State to inspect facilities and documents related to a licence. With the Space Industry Act 2018, the intent is, rather than placing such requirements in licence conditions, to instead follow a model closer to that used in aviation and set out the requirements in regulations. We believe this is a logical approach as the requirements will apply to all licensed activities.

In addition to the powers set out in the Regulations, it is anticipated that the regulator will utilise less formal measures to address less serious concerns. These are likely to include advice or warning letters or increasing the frequency of engagements with the licensee.

The regulations covering monitoring and enforcement are set out in Part 13 of the Regulations.

Chapter 1 lists any definitions specific to this Part. “Information” means any information held in any form. The intent behind this broad definition is to avoid providing an exhaustive list that may need to be updated as licensed activities develop. This definition is used in other legislation, for example the Road Traffic Act 1988, section 159A (Disclosure of information)[48] and the Access to Justice Act 1999, Schedule 3, paragraph 8[49].

[48] https://www.legislation.gov.uk/ukpga/1988/52/section/159A

[49] http://www.legislation.gov.uk/ukpga/1999/22/schedule/3

Chapter 1 also creates two offences: the offence of obstructing an inspector or regulator; and the offence of impersonating an inspector. These offences apply to anyone, not just licensees. These are criminal offences and criminal sanctions will apply to anyone found guilty of committing them. These sanctions can be found in regulations 210 and 212 respectively.

Chapter 2 covers the obligation to provide information to the regulator. Regulation 213 sets out the persons to whom this obligation applies. Regulations 214 and 215 create a requirement for those persons to provide the regulator with any information requested via an information notice. Regulation 216 creates an offence for failure to do so and sets out that taking all reasonable steps and exercising due diligence to avoid committing the offence is a defence. The criminal sanction at regulation 217 will apply to this offence. There is no defence, however, for an offence under regulation 218, which covers knowingly or recklessly providing false information. The associated sanction is at regulation 219. Regulation 220 creates offences around false recording. The sanction is at regulation 222. There is a defence (regulation 221) in the case of destroying a document or record during the period for which the person is obliged to keep it. This is to allow for the possibility that someone could inadvertently destroy a document whereas the nature of the other offences suggests deliberate acts of fraud.

Inspectors

Chapter 3 of Part 13 covers the appointment, duties and powers of inspectors.

Regulations 227 to 229 cover powers of entry; of inspection and examination; and of taking samples. Regulation 230 covers powers of requiring information and documents. Paragraph 1 requires any person who an inspector has reasonable cause to believe is able to provide information relevant to their investigation to answer the inspector's questions and sign a declaration of the truth of their responses. This regulation would apply to anyone, not just licensees. There is no new offence associated with this regulation because the requirements are covered by the offence of obstructing an inspector covered in Chapter 1.

Regulation 231 sets out inspectors' powers in relation to articles and substances. These include removal for examination, inspection or testing or for use in proceedings for an offence. Regulation 232 gives inspectors the power to require the use of facilities and assistance to enable them to exercise inspectors' powers.

Regulations 233, 234 and 235 cover an inspector's powers to issue a series of notices where the inspector believes a person is contravening, or conducting an activity like to convene, licence conditions or provisions of the Space Industry Act 2018 or a regulation made under the Act.

The first step is a contravention notice (regulation 233) which will give a period for the contravention to be remedied and may include directions as to the measures to be taken.

If this period expires without full remedy of the contravention, the inspector may issue a warning notice (regulation 234). This notice will set out relevant powers of the inspector, the regulator and the Secretary of State. All of these bodies have the power to order the recipient to stop the activities identified in the contravention notice. The warning notice gives a further period to remedy the contravention in full.

If this further period expires without full remedy, and the inspector identifies a risk to public safety or the national security of the UK, a prohibition notice may be issued under regulation 235. This will direct the person to whom the contravention notice was issued to stop carrying on the activities specified in the notice unless that person remedies the contravention.

A person may appeal against the decision to serve a prohibition notice. Grounds for appeal are prescribed by paragraph 8 of Schedule 10 to the Act.

Regulation 237 states that these powers conferred on the inspector includes a power to do anything incidental that is necessary for the inspector to fulfil the purpose of their appointment.

Sharing of information and restrictions on disclosure

Chapter 4 sets out the bodies with whom the regulator may share information. This includes information obtained by the regulator in respect of licence applicants and by inspectors in the exercise of their powers.

Chapter 5 covers the prohibition against disclosure of protected information. Section 26(3)(g) of the Act provides for regulations to restrict the disclosure of information obtained or shared under the monitoring and enforcement regulations. Protected information means information obtained by the regulator or an inspector under the monitoring and enforcement regulations or information shared with the persons or bodies listed in regulation 239(1). It is an offence for a person to disclose protected information except in accordance with Section 2, and the criminal sanction at regulation 242 will apply to this offence. Regulation 243 sets out defences to this offence.

Section 2 covers exceptions to the prohibition against disclosure of protected information. These include consent from the person or body who shared the information and disclosure by the persons listed in regulation 246(1) in performing their duties or exercising their powers. Other exceptions include: disclosure to public or local authorities and their officers; disclosure required under freedom of information legislation; and disclosure for the purposes of legal proceedings, inquiries and investigations.

The prohibition against disclosure of protected information does not apply where the information is anonymised in accordance with regulation 250.

Questions

66. Are there any other considerations you think the monitoring and enforcement regulations should address? Please provide details.

Part 14: Civil Sanctions (stop notices)

Part 14 incorporates the “stop notices” scheme provided by the Regulatory Enforcement and Sanctions Act 2008. A stop notice is a notice prohibiting the recipient from carrying on a specified activity until the person has taken specified steps

The regulator may serve a stop notice on any person carrying on or likely to carry on an activity that the regulator believes may involve an offence under the Act or the regulations made under the Act and risks causing serious harm to:

- public safety;
- persons carried in spacecraft or carrier aircraft;
- persons at work at spaceports, mission management facilities or sites used in connection with the provision of range control services;

- the interests of persons in relation to the use of land, sea and airspace;
- the interests of persons with interests in property carried by spacecraft.

The grounds for appeal against a stop notice are listed in regulation 253. Where the person served with a stop notice has taken the steps specified in the notice, the regulator may decide to issue a "completion certificate". The grounds for appeal against a decision not to issue a completion certificate are listed in regulation 255.

Regulation 256 sets out the circumstances under which persons may be compensated for loss suffered as a result of service of a stop notice or refusal of a completion certificate.

It is an offence to fail to comply with a stop notice within the time limit specified in the notice. The sanction is: on summary conviction, a fine or imprisonment for up to 12 months[50] (or both); on conviction on indictment, a fine or imprisonment for up to two years (or both). This is set out in regulation 257 and is prescribed by section 49 of the Regulatory Enforcement and Sanctions Act 2008[51].

The stop notices scheme is prescribed by section 59(3) of the Act and Part 3 of the Regulatory Enforcement and Sanctions Act 2008, and so is not subject to consultation.

Part 15: Occurrence reporting

Regulations 259 - 260 create a duty for a licensee to report occurrences to the regulator with the sole objective of preventing spaceflight accidents or major accidents, without apportioning blame or liability. The occurrences are those that include spaceflight accidents, major accidents or any other fortuitous or unexpected events arising out of or in the course of spaceflight activities (or preparations) and which, if not corrected or addressed, could result in a spaceflight accident or major accident.

The occurrence report will contain general details necessary to identify the key information to allow the regulator to assess the occurrence and must be sent within 72 hours in writing. At regulation 263 there are five basic categories of occurrence that relate to various phases, technical failures or adverse consequences suffered by any human occupant of the launch vehicle. The regulation provides provisions for protecting information and permitted disclosures including confidential information and restrictions on disclosing US technical data; court applications for disclosure and the contraventions and sanctions that are available if the regulations are breached.

Part 16: Duty to inform the regulator

Regulation 270 creates a duty for a "relevant person" - a person applying for a licence under the Act, or a licensee - to inform the regulator as soon as possible of any significant change in any of the information provided to the regulator. This applies to any information that has been

[50] The current maximum sentence that can be passed on summary conviction is 6 months. The government has the power to increase that to 12 months under section 154(1) of the Criminal Justice Act 2003, but that section has not been brought into force. Until section 154(1) is brought into force, any provision in legislation imposing a maximum sentence of 12 months on summary conviction should be read as 6 months, because that is the maximum sentence the court would have the power to impose.

[51] https://www.legislation.gov.uk/ukpga/2008/13/section/49

provided. This notification must be made in writing and applies to information that may have been provided either by, or on behalf of, the relevant person. It applies whether the information provided was in or with the application for a licence. It also applies to information provided after the licence has been granted.

Where the information was provided by someone other than a relevant person then the obligation to inform the regulator of any significant changes applies as soon as possible after the relevant person becomes aware of the change in the information that was provided to the regulator.

Regulation 271 creates an offence for a person to either fail to comply with this requirement, or to make a statement or provide information they know to be false, or recklessly to make such a statement or provide such information. If charged with such an offence then a defence is available if a person can show that they took all reasonable steps and exercised all due diligence to avoid committing the offence.

Question

67. Part 16 outlines provisions that apply to any information provided by a relevant person. There are also specific obligations in other regulations that create a duty for licensees to inform the regulator of changes. Do you agree that the general provision in regulation 270 should exist in addition to the specific obligation in other regulations? Please provide details.

The Spaceflight Activities (Investigation of Spaceflight Accidents) Regulations

The Space Industry Act 2018 and the regulations made under it have been drafted with safety at their heart. But in addition to general preventative safety requirements, regulations must also allow for effective action and independent investigation in case of an accident, so as to prevent its recurrence. Worldwide experience to date indicates that spaceflight launches carry an inherent risk of accidents and incidents. Launch accidents may damage property or the environment or cause serious injury or the loss of life.

There are no UK or international guidelines, treaties or regulations relating to the investigation of spaceflight accidents. The Outer Space Act 1986 does not contain guidance or requirements for commercial spaceflight accident investigation and the current civil aviation accident investigation legislation will not be applicable. Without a framework for accident investigation, it is possible that spaceflight accidents and incidents will not be adequately investigated. The opportunity to prevent future accidents could, therefore, be missed.

The Spaceflight Activities (Investigation of Spaceflight Accidents) Regulations made under section 20 of the Space Industry Act 2018 provide this framework. It is based on the existing successful international frameworks in Civil Aviation under ICAO Annex 13.

The intent is to ensure independent and expert investigation into spaceflight accidents, which will avoid conflicts of interest, ensure safety lessons can be learned and improvements

implemented to increase safety where appropriate, and ultimately reduce the risk of future accidents. This will be done without apportioning blame or liability.

In Part 1, regulations 1 and 2 cover citation and commencement and application of the Spaceflight Activities (Investigation of Spaceflight Accidents) Regulations. Regulation 3 sets out definitions used in the Regulations, including descriptions of the representatives, advisers and inspectors that may participate or assist in an investigation. The definitions also set out what is meant by “person involved” in the Regulations. “SAIA” means the space accident investigation authority nominated by the Secretary of State under regulation 5. The meaning of “safety investigation”, “serious injury”, “spaceflight accident” and “serious spaceflight accident” are also set out. Regulation 4 covers service of notices and other documents required or authorised by the Regulations.

Inspectors and the safety investigation authority

Part 2 covers inspectors and the safety investigation authority. Regulation 5 requires the Secretary of State to nominate an SAIA. The requirements regarding the authority, independence and resources of the SAIA are also set out in this regulation. Regulation 6 covers the appointment of inspectors of spaceflight accidents, including the Chief Inspector of Spaceflight Accidents, their deputy and the investigator-in-charge of a safety investigation. Obstructing or impeding an inspector without reasonable excuse or knowingly providing false or misleading information are contraventions of the Regulations (see Part 7.)

First steps after the spaceflight accident

Part 3 covers first steps after the spaceflight accident. Any person involved who has knowledge of the occurrence of a spaceflight accident in or over the UK must notify it without delay to the Chief Inspector and the police (“person involved” in this context is a defined term – see regulation 3). Failure to notify without delay the Chief Inspector (and, in the case of a serious spaceflight accident, the police) without reasonable excuse is a contravention under Part 7 of the Regulations (see regulation 37). Once notified of an accident the Chief Inspector must notify any other state concerned.

Regulation 8 sets out the requirements on operators of spacecraft involved in an accident around provision of information to the Chief Inspector regarding persons and dangerous goods on board. Regulation 8(2) also requires the provision of this information to authorities designated to liaise with relatives of persons on board and, where necessary, medical units. The intent is to ensure that, in the event of injury or fatalities, the authorities can inform relatives and provide appropriate medical treatment. In addition, dangerous goods at accident sites could create a hazard for persons attending the site. Information regarding persons on board must be treated as confidential, in accordance with regulation 8(3). Failure to provide information on persons and dangerous goods on board a spacecraft following a spaceflight accident and unauthorised disclosure of information relating to persons on board are contraventions under Part 7 (see regulation 43).

Regulation 9 covers preservation of evidence. The intent of this regulation is to prevent any person from interfering with evidence or contaminating the site of the spaceflight accident. Evidence-related activities should be authorised by the investigator-in-charge or other authorities in control of the site, although persons should still be able to take any actions necessary for safety reasons or to assist injured individuals. Regulation 9 also requires a person involved to take all steps to preserve information in relation to the accident, including preventing erasure of recordings. Any person who, without reasonable excuse, contravenes

any of the prohibitions or (in the case of a person involved) fails to take the steps required in regulation 9 contravenes the Regulations under Part 7 (see regulation 40).

Regulation 10 sets out the requirements around coordination of investigations, including arrangements between the SAIA, the police and other statutory authorities who may institute investigations following a spaceflight accident.

The safety investigation and inspectors' powers

Part 4 covers the safety investigation and inspectors' powers. Regulations 11-13 set out requirements around the safety investigation. The objective of a safety investigation is the prevention of spaceflight accidents. It must be independent of and separate from proceedings to apportion blame or liability.

Regulations 14-16 cover the duties and powers to investigate of the Chief Inspector. The Chief Inspector has a duty to cause a safety investigation to be conducted where a serious spaceflight accident occurs in or over the UK. A serious spaceflight accident is one in which an individual is fatally or seriously injured – or where there was a high probability of this. The Chief Inspector may cause a safety investigation to be conducted where a spaceflight accident that is not a serious spaceflight accident occurs or where they expect to draw safety lessons for spaceflight activities from the safety investigation.

Regulation 16 sets out the circumstances under which the Chief Inspector may investigate spaceflight accidents occurring elsewhere than the UK.

Regulation 17 sets out the powers of the SAIA to request assistance with UK safety investigations.

Regulations 18-19 cover the situations in which states may appoint accredited representatives, advisers and experts to participate in a safety investigation. The intent is to enable states concerned or with an interest regarding the spaceflight accident or who are aiding in the investigation to provide any relevant expertise and to receive information regarding the investigation. Regulation 20 enables the Chief Inspector to appoint accredited representatives and advisers to an investigation carried out by another state to enable the UK to participate in that state's investigation.

Regulations 21-22 introduce the powers of the investigator-in-charge of an investigation, and the extent to which the exercise of those powers may be delegated. Regulations 23-26 then specify each of the powers which the investigator-in-charge may exercise: their rights of access to information (regulation 23), powers of entry and inspection (regulation 24), the power to call and examine witnesses (regulation 25) and powers relating to evidence obtained from a witness (regulation 26)

The intent is to provide inspectors with access to any information that is necessary for the purposes of carrying out safety investigations. For instance, immediate and unrestricted access to an accident site and any wreckage may be required to prevent evidence being contaminated or, where it falls in the sea, washed away. Access to data recordings, records and the results of autopsy or medical examinations may also be required.

Entry and inspection of dwellings may be necessary for the purposes of the safety investigation – a warrant may be required unless access to the dwelling is required urgently. Inspectors may also need to summon witnesses to attend an interview to answer any question or produce any document, record, information or other evidence relevant to the safety investigation. Any

person who fails to comply with such a summons contravenes the Regulations under Part 7 (see regulation 39)

Regulation 27 covers release of evidence to the owner and applies where property is held by the SAIA for the purposes of a safety investigation. Regulation 28 enables the SAIA to recover reasonable expenses from a licensee.

Sensitive safety information

Part 5 provides for the protection of sensitive safety information. Regulation 29 defines "relevant person" and "sensitive safety information". For these purposes Regulation 30 sets out the circumstances under which sensitive safety information may or may not be disclosed. The intent is to protect sensitive information obtained in the course of the safety investigation relating to individuals and companies as well as information relating to sensitive technology and material produced by the SAIA during the investigation. The purpose of doing so is to ensure that the objective of the safety investigation, and future safety investigations, is not jeopardised.

Where information is not sensitive there are circumstances where the SAIA may disclose it to certain persons and bodies, such as the licensee; persons involved in the spacecraft manufacture, maintenance or training; others using the same type of spacecraft; the UK spaceflight Regulator; and the European Space Agency. The intent is to enable lessons learned to be shared.

Regulation 30 also allows for the SAIA to inform victims and relatives of, or make public, findings relating to the spaceflight accident, in certain circumstances. Regulation 31 allows for court applications to be made regarding the disclosure of sensitive safety information.

Failure to protect sensitive safety information and unauthorised disclosure of information relating to a safety investigation are also contraventions of the Regulations (see regulation 42 of Part 7.

The safety investigation report and safety recommendations

Part 6 covers the safety investigation report and safety recommendations. Regulation 32 sets out the investigator-in-charge's duties regarding a safety investigation report. The investigator-in-charge is required to prepare a report of the safety investigation and publish it as soon as possible. Sensitive safety information will only be included in so far as relevant to the analysis of the spaceflight accident. The report will make clear the objective of the prevention of spaceflight accidents, without the apportionment of blame or liability. The report may contain safety recommendations. Identities of individuals involved in a spaceflight accident must not be revealed. Regulation 32(5-6) requires the investigator-in-charge to publish interim statements where it is not possible for the report to be published within 12 months of the accident.

Regulation 32(7) provides that any part of the safety investigation report based on information obtained in the examination of witnesses under regulations 25 and 26 is inadmissible in any judicial proceedings which have the purpose of attributing or apportioning liability or blame, unless a relevant court determines otherwise. As witnesses are required to answer questions put by an investigating Inspector, and do not have the option of remaining silent, it is not appropriate for their testimony to be used in judicial proceedings which may be seeking to impose liability or blame, as this could ultimately contravene their rights not to incriminate themselves.

Regulation 32(8) sets out that an inspector is not required to provide opinion evidence, analysis of information provided, or information obtained in the examination of witnesses to judicial proceedings which have the purpose of attributing or apportioning liability or blame, unless a relevant court determines otherwise. This safeguards the independence of the SAIA, and ensures that its primary function of investigating spaceflight accidents without apportioning liability or blame is not compromised. The intent is to maintain the independence of the SAIA and the impartiality and efficacy of the investigatory process.

Regulation 33 requires the investigator-in-charge to serve notice of a safety investigation report on persons whose reputation could be adversely affected by the safety investigation report prior to publication. Where the person is deceased, notice will be served on the person who the investigator-in-charge deems best represents their interests. Such persons will have the opportunity to provide written representations to the investigator-in-charge regarding the analysis of the accident proposed in the report.

Regulation 34 requires the investigator-in-charge to provide copies of safety investigation reports to the Secretary of State, and anyone who received notice of the report under regulation 33.

Regulation 35 requires the SAIA to make safety recommendations where preventative action must be taken promptly to enhance the safety of spaceflight activities. A safety recommendation must be made in writing, address the authority and the person in the best position to give effect to it, and must be published. The recommendation does not create a presumption of blame or liability for the accident. The person to whom the safety recommendation is addressed is required to acknowledge it and say what action is being taken, or considered, to implement the recommendation (see regulation 36(1). The SAIA is then required to inform the person concerned whether they consider the action taken is sufficient (see regulation 36(2)). Both the addressee of the recommendation and SAIA must keep records of the actions taken in relation to a safety recommendation, and SAIA's response (see regulation 36(3) and (4)).

Contraventions and sanctions

Part 7 sets out contraventions under the Spaceflight Activities (Investigation of Spaceflight Accidents) Regulations. A person who has contravened the Regulations as set out in regulations 37 to 44 is guilty of an offence. The penalty on summary conviction is a fine (not exceeding the statutory maximum in Scotland or Northern Ireland). The penalty on conviction on indictment is imprisonment for a term not exceeding 51 weeks.

We are considering the appointment of the Air Accidents Investigation Branch to carry out functions under these Regulations and would welcome your views.

Questions

68. Are there any other considerations you think the accident investigation regulations or guidance should address? Please provide details.

The Space Industry (Appeals) Regulations

The intent behind the Appeals Regulations is to provide a route of appeal against certain decisions under the Space Industry Act 2018 and the Outer Space Act 1986. (There is currently no appeals process under the Outer Space Act 1986).

The draft Space Industry (Appeals) Regulations cover appeals under both of these Acts and the process will be the same for appeals carried out under either Act.

Many of the provisions in these regulations are consistent with those used under the civil procedure[52] (the rules make up a procedural code with an overriding aim to enable the courts to deal with cases justly in civil rather than criminal cases) and other similar appeals processes, including employment tribunals[53].

Chapter 1 of the draft Regulations sets out the definitions specific to these Regulations. “Appealable decision” means a decision taken by the regulator under the Outer Space Act 1986 or the Space Industry Act 2018, which is subject to a right of appeal. Further details of these are set out below. “Appellant” means the person who applies for permission to bring an appeal. “Respondent” means the person which made the decision which the subject of the appellant’s appeal (this will usually be the Civil Aviation Authority).

Panels and appealable decisions in Chapter 2 of the draft Regulations covers the establishment and composition of the appeals panel and set out further detail of appealable decisions.

The Secretary of State is responsible for drawing up a list of people eligible to hear appeals in accordance with regulation 3. The panel list must consist of at least five members drawn from senior officials within UK Space Agency and government departments or otherwise specified by the Secretary of State.

When an application for permission to appeal is received, the Secretary of State must appoint an appeals panel under regulation 6, from the panel members list to determine appeals or requests for permission to appeal in accordance with regulation 4. The panel must consist of three or more members, one of whom must be designated as a chair by the Secretary of State. Where it is not possible to appoint three members because a proposed member has a conflict of interest, a panel may sit with two members. Where there is an even number of members on a panel, the chair will have a casting vote.

Regulation 5 covers the provision of staff, including a secretary, and facilities to appeal panels.

Appealable decisions

Rights of appeal are set out in Schedule 10 of the Space Industry Act 2018 and include the right to appeal against a:

- Refusal of an application for a licence;
- Grant of a licence subject to conditions;

52 https://www.justice.gov.uk/courts/procedure-rules/civil
53 https://www.gov.uk/government/publications/employment-tribunal-procedure-rules

- Refusal to renew a licence;
- Refusal to consent to the transfer of a licence;
- Variation, or refusal to vary, a licence;
- Suspension or revocation of a licence;
- Any other decisions of the regulator under the Space Industry Act 2018 or regulations made under it that are prescribed;
- Any other decisions of the Secretary of State under the Outer Space Act 1986 that are prescribed.

Regulation 7(1) prescribes the other decisions under the Space Industry Act 2018 which may be subject to an appeal. Regulation 7(2) sets out the persons who may bring an appeal in relation to these additional decisions.

Permission to appeal

Chapter 3 of the draft Regulations covers the permission to appeal part of the appeals process. An application for permission to appeal must be made to the secretary within 14 days after the date on which the decision which is being appealed was made. This period may be extended if the applicant demonstrates that it did not receive notice of the decision until a date within the period of 14 days before the application for permission to appeal was made or the panel is satisfied that the circumstances are exceptional.

Regulation 8(3) and (4) set) out how an application for permission to appeal is made, and what the application should contain. Under regulation 8(5), the application is subject to a fee to be paid by the appellant when the application is made. Regulation 8(6) permits an application for permission to be made on behalf of another person if the person making the application has the appropriate authentication The secretary to the appeal panels must serve notice of the application to appeal and accompanying documents on each respondent as soon as practicable and no later than 7 days after receipt. The secretary will also publish the notice on the panel's website (see paragraph (7)).

The fees payable by the appellant and persons wishing to intervene in respect of appeals, the time at which they must be paid and the consequences of non-payment are set out in regulation 9. These fees corresponded to the fees charged for similar process in the civil procedure applied in UK courts.

Regulation 10 sets out the requirements which must be satisfied if the respondent wishes to respond to an application for permission to appeal. Upon receiving any response from the respondent the appeal panels secretary must distribute it to all other parties.

Application to intervene

A person with sufficient interest in the decision which is the subject of the appeal may apply to the panel for permission to intervene in the appeal in accordance with regulation 11. Such an application must be made within 14 days of the date on which notice of the application for permission to appeal was published on the panel's website. The secretary must give notice of the application for permission to intervene to all the parties to the appeal and invite them to make representations in relation to the application within a specified period. The panel will take into consideration the representations of the parties and may permit the intervention if satisfied

that the applicant has a sufficient interest in the decision and that allowing the applicant to intervene is necessary or desirable for the proper resolution of the appeal.

When permission to intervene has been granted the panel may direct that the intervener is served with documents submitted to the panel and may require the intervener to submit a statement of intervention in accordance with regulation 11(8) and (9).

Determination of application for permission to appeal

Regulation 12 sets out how the panel will consider an application for permission to appeal. The application will be considered without a hearing. When the panel determines the application it may: give permission to appeal; give permission to appeal but on limited grounds or subject to conditions; or refuse permission to appeal. The panel must give written notice of its decision to the Secretary of State, the appellant and the respondent within 7 days.

Where permission to appeal is rejected, or granted subject to conditions or limitations, the written notice must contain a statement of the reasons for the refusal, or for any limitations or conditions. Where permission to appeal is granted the panel will determine whether it is to be treated as a standard appeal or a complex appeal.

The panel must refuse permission to appeal if it is demonstrated that the appeal is brought for reasons that are trivial or vexatious or the appeal does not have a reasonable prospect of success.

Where permission to appeal is granted, the decision being appealed and, where the decision being appealed is the imposition of conditions on a licence, the grant of that licence has no effect pending the determination of the appeal unless the panel direct otherwise.

Appeals

Chapter 4 of the draft Regulations provides for the determination of the substantive appeal. An appeal may be determined by the same panel which considered the application for permission to appeal. After receiving permission to appeal the appellant must submit a notice of appeal to the secretary of the appeal panels and the other parties to the appeal within the applicable period. (“Applicable period” is defined in regulation 2, meaning 14 days in a standard appeal and 28 days in a complex appeal.) Regulation 13(3) and (4) sets out what the notice must contain.

After the notice to appeal is served the respondent must, within the applicable period, serve on the panel and all other parties a notice responding to the notice of appeal. Regulation 13 (6) and (7) set out the requirements on the content of the respondent’s notice.

After the respondent’s notice is served the appellant may, within the applicable period, serve on the panel and all other parties a reply to the respondent’s notice (regulation 13(9). The reply must be served on all parties as soon as possible (regulation 13(10)). Regulation 13(11) gives all parties to the appeal (including any interveners) the right to request copies of any documents referred to in a list of documents provide by the appellant or the respondent. Regulation 14 gives the panel power to issue procedural directions on whether, for example, there is to be an oral hearing, the procedure for any such hearing or what further evidence may be submitted if there is to be no hearing. All parties to the appeal may be present at a hearing and will receive and have the opportunity to respond to evidence submitted by other parties.

If there is to be an oral hearing the panel must give at least 14 days’ notice to parties.

Regulation 14(5) sets out what directions that the panel may give, either of its own initiative or on the application of a party to the appeal. In accordance with regulation 14(4) the panel may also give other such directions as it thinks fit to ensure proceedings are dealt with justly and at proportionate cost. Regulation 14(6) also gives the panel power to seek further evidence, by questioning the parties on its own initiative, inviting the parties to make further submissions or asking for further information. Where parties wish to apply to the panel to make directions they must do so in accordance with regulation 14(7).

Regulation 15 applies where a document is required to contain a statement of truth. The regulation sets out what the statement must contain, depending on the situation in which it is required. Regulation 15(10) creates an offence regarding false statements in documents verified by a statement of truth.

Regulation 16 sets out when documents may be served by email and the requirements where this applies.

Regulation 17 gives the panel power to make an order prohibiting the disclosure of specified documents or information. Regulation 17(3) sets out the actions parties must take if they consider the panel should make such an order. The panel must ensure that information is not disclosed contrary to the interests of national security.

Regulation 18 contains provisions relating to directions the panel may give regarding evidence; decisions of the panel on admitting or excluding evidence; the procedures for evidence given by witnesses; and the application of the Civil Procedure Rules 1998 to evidence given.

Regulation 19 covers requirements for hearings to take place in private and the attendance of parties at hearings. The rationale behind holding oral hearings in private is that sensitive information may be covered, either commercial in nature (for example, regarding new technologies or situations that could affect a company's share price if disclosed prematurely) or that gives rise to issues of national security. There may also be bilateral or international agreements that restrict information that can be put into the public domain.

Regulation 20 sets out the orders the panel may make if a party fails to comply with a direction.

Regulation 21 sets out when an appeal may be struck out. Regulation 22 covers amendments to notice of appeal and regulation 23 withdrawal of the appeal and the implications of doing so. The regulator may reconsider its decision before the appeals panel reaches its decision, if the panel agrees to this.

Regulation 24(1)-(2) sets out the procedures to be followed by the panel in giving notice of its decisions on appeals and that the decision must be made within the applicable period. Regulation 24(3)-(6) sets out what the regulator must do after receiving notice of decisions on appeals. The panel's decision will be published on the panel's website.

Regulation 25(1) lists the persons who are prescribed for the purposes of section 66(1) of the Space Industry Act 2018, which covers certification of documents for the purpose of evidence in legal proceedings. Regulation 25(2) lists the persons who are prescribed for the purposes of section 66(3) of the Act, which covers records of certain matters listed in 66(3)(a) to (c) that are to be considered as evidence in legal proceedings.

If the appellant disagrees with the outcome of the appeal, they can apply to the courts for a judicial review. The regulator may also apply for a judicial review, although neither of these provisions need to be provided for in the regulations. The judicial review process contains a

pre-action protocol, which starts with a 'letter before action'. The regulator could take action in response to this so that a full judicial review would not be needed.

More information on appeals will be available in the draft appeals guidance document.

Question

69. Are there any other considerations you think the appeals regulations or guidance should address? Please provide details.

Impact assessment

Impact Assessments are used to estimate the impact on individuals, groups and businesses with the aim of understanding the overall impact on society from implementing legislative and regulatory changes. As part of this, the business impact target for this Parliament reflects the Government's ambition to continue to bear down on the costs to business of regulation while maintaining important regulatory protections. The general threshold for independent scrutiny of Impact Assessments is where the equivalent annual net direct cost to business (EANDCB) is greater than ±£5 million.[54]

An Impact Assessment for the Space Industry Act 2018 was published on 16 September 2016[55]. A further Impact Assessment, specifically for the draft secondary legislation, has been published alongside this consultation document. This Impact Assessment considers in more detail the impact of the proposed draft regulations and provides an initial estimate of the expected impacts. The accompanying Impact Assessment's Summary Sheets provide a high-level overview of the rationale for intervention, policy objectives and expected impacts for each option.

The Impact Assessment looks at the main affected stakeholders, costs, benefits and risks for the following three options:

- Option 1: Do nothing – There will be no additional regulations to enable commercial spaceflight launches from the UK. It is assumed that no commercial spaceflight launch industry will develop in the UK because of the uncertainty about how the market will be regulated.
- Option 2 (preferred): Minimum viable regulations to enable commercial spaceflight launches from the UK. This option sets out a package of regulations, guidance and regulator's licensing rules that aims to provide a framework for licensing and monitoring spaceflight launches from the UK. This aims to balance the policy objectives of supporting growth, innovation and a sustainable UK launch market against the need to protect public safety, national security, the environment, airspace and international relations. This is appraised in the Impact Assessment, with scenario analysis to demonstrate the level of uncertainty.
- Option 3: Alternative to regulation – Existing legislation, guidance and engagement, and/or public provision. Under this option, the Space Industry Act 2018, Outer Space

[54] Please see the 'Better Regulation Framework: Guidance 2018' for more information, available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/735587/better-regulation-framework-guidance-2018.pdf

[55] http://www.legislation.gov.uk/ukpga/2018/5/pdfs/ukpgaod_20180005_en_001.pdf

Act 1986 and other existing legislation would be used to regulate the UK launch market and/or publicly provide more aspects of the market. As illustrated through scenario analysis in the Impact Assessment, these alternatives are expected to result in lower net benefits compared to option 2, with greater risks and uncertainty of outcomes, but this is also highly uncertain.

We welcome comments and evidence on the analysis set out in the accompanying Impact Assessment to help provide a sound basis for our final assessment of impacts, such as potential costs, benefits and risks arising from the proposed secondary legislation. Specific areas on which we would benefit from input are set out in our consultation questions. At the very least, it is recommended that the accompanying Impact Assessment's Summary Sheets are reviewed before responding to the consultation.

Question

70. What is your organisation?

    a) a spaceport
    b) a range control service provider
    c) a launch operator
    d) an orbital operator
    e) a trade body
    f) a union
    g) a user of launch or satellite services e.g. imagery
    h) an academic institution
    i) an international body or group
    j) an environmental group or organisation
    k) an insurance, banking or finance company
    l) a foreign government
    m) an individual
    n) another type of business or organisation

71. Is your organisation considering applying for a licence under the Space Industry Act 2018?

72. Which of the UK launch forecast scenarios in Annex 3 of the accompanying Impact Assessment do you think is most realistic? Please choose one option.
    a) Low
    b) Central
    c) High
    d) None of the above
    e) Not sure

73. If you answered 'none of the above' to question 72 please explain why including evidence if possible.

74. Have any stakeholders affected by the proposed secondary legislation not been captured in the accompanying Impact Assessment? Please provide details, including the details of these stakeholders and how they may be affected, and costs and/or benefits in £ if possible or qualitative costs and/or benefits if not monetisable.

75. Will your organisation have to purchase any equipment or systems to comply with the proposed secondary legislation? Please provide details, including estimated costs in £ if possible or qualitative costs if not monetisable.

76. Will you or your organisation have to implement or change any processes to comply with the proposed secondary legislation? Please provide details, including estimated costs in £ if possible or qualitative costs if not monetisable.

77. Are there any benefits associated with the proposed secondary legislation that are either misrepresented or not captured in the accompanying Impact Assessment? Please provide details, including estimated benefits in £ if possible or qualitative costs if not monetisable.

78. Are there any costs associated with the proposed secondary legislation that are either misrepresented or not captured in the accompanying Impact Assessment? Please provide details, including estimated benefits in £ if possible or qualitative costs if not monetisable.

79. Will you or your organisation familiarise themselves with the secondary legislation and accompanying guidance?

80. If you answered 'yes' to question 79, please provide details of the type and number of employees you expect to familiarise themselves with the secondary legislation and accompanying guidance for your organisation.

81. If you answered 'yes' to question 79, please also include an estimate of how long you expect this take (in working days) and an estimate of the cost in £ if possible.

82. If you answered 'yes' to question 71, what type and number of employees do you expect to engage with the regulator on behalf of you and/or your organisation during:

    a) The licensing process
    b) The regulator's monitoring regime

83. If you answered 'yes' to question 71, how long (in working days) do you expect you and/or your employees in your organisation to spend on:

    a) Engaging with the regulator during the licensing process
    b) Engaging with the regulator to monitor compliance

84. If you answered 'yes' to question 71, what type and number of people are you likely to designate and/or employ for the prescribed roles set out in the proposed secondary legislation? Please provide details, including associated cost estimates in £ if possible or qualitative costs if not monetisable.

Catalogue of consultation questions

Context and Background

1. Do you have any comments on our approach to assessment of environmental effects?

   Y/N. Please provide details.

2. Would you welcome a Traffic Light System for orbital operator licence applications under the Space Industry Act 2018?

   Y/N.

3. Do you have any comments on the proposed Traffic Light System?

   Y/N. Please provide details.

4. Do you have any comments on our approach to orbital activities?

   Y/N. Please provide details.

5. Do you have any comments on the Regulator's Licensing Rules?

   Y/N. Please provide details.

6. Are there any matters addressed in the Context and Background Information section of the consultation document on which you would like to comment?

   Y/N. Please provide details.

Part 1: Preliminary

7. Are there any terms used in the regulations that are not defined that you think should be defined?

   Y/N. Please provide details.

Part 2: Grant of a licence - general

8. Are there any other considerations you think the eligibility criteria and prescribed roles regulations or guidance should address?

Y/N. Please provide details.

9. Are there any other considerations you think the grant of licence regulations or guidance should address?

   Y/N. Please provide details.

Part 3: Grant of a spaceflight operator licence - risk

10. Schedule 1 details the types of information required by the operator on the manifested payload(s) ahead of launch, and the use/presentation of this information within the safety case, as well as how this information will be used by the regulator. Do you have any comments on the proposed approach?

    Y/N. Please provide details.

11. Paragraph 5 of Schedule 1 requests a schedule of the preparatory events linked to the safety of a launch campaign. This includes grouping events into 'days ahead of launch.' Do you have any comments on the fidelity of the events?

    Y/N. Please provide details.

12. The Regulations explain how the safety case can be used to demonstrate the safety of single or multiple missions. Do you have any comments about this approach?

    Y/N. Please provide details.

13. The Regulations set out the elements of the safety case for spaceflight operators, including the minimum requirements. Do you have any comments on the safety case or the minimum requirements?

    Y/N. Please provide details.

14. The information the safety case must contain is set out in Schedule 1 – is there any further information you think it should be necessary for the safety case to contain or anything currently in the requirements that should not be in the safety case?

    Y/N. Please provide details.

15. What do you understand by the phrase (the launch vehicle or carrier aircraft's) "method of operation" in the safety case requirements set out in Schedule 1?

    Please provide details.

16. Do you agree with the list of safety critical systems in paragraph 11 of Schedule 1?

    Y/N. Please provide details.

17. Do you think licensees should share their safety cases with other users/potential users of the spaceport or those other users who have prepared a safety case?

    Y/N. Please provide details.

18. If you intend to apply for a spaceflight operator licence, would you share your safety case with other users/potential users of the spaceport or those other users who have prepared a safety case?

    Y/N. Please provide details.

19. Are there any other considerations you think the spaceflight regulations or associated guidance should address with regards to safety?

    Y/N. Please provide details.

Part 5: Grant of a spaceport licence

20. If you intend to apply for a spaceport licence, would you share your safety case with other users/potential users of the spaceport or other users who have prepared a safety case?

    Y/N. Please provide details.

21. Regulation 39(3)(a) requires the spaceport licence applicant to take into account any operator licence applicant in developing its safety case. Similarly, regulation 31(4)(b) requires an operator licence applicant to consult any proposed spaceport licensee on its operating manual. Do you see a need for a specific requirement for spaceport and operator licensees to share their respective safety cases and ground safety analysis?

    Y/N. Please provide details.

22. It is foreseeable that there will be an overlap between the ground safety analysis conducted by a launch operator and the spaceport's safety case. Regulations are drafted to meet the specific requirements for each type of licence. Do you see any aspects of the spaceport safety case regulations that should more closely align with regulations 30 and 31?

    Y/N. Please provide details.

23. Are there any other considerations you think the grant of a spaceport licence regulations and associated guidance should address?

    Y/N. Please provide details.

Part 6: Range control services

24. The regulations allow licensing of range control services from a designated site, but this does not preclude more than one licensee from operating at the same site at different times. The licensing system will also allow a licensee to operate from more than one site if desired, or to apply for their existing licence to cover a new site, under a licence variation.

    Do you think there are any drawbacks to the overall approach to sites for range control licensees?

    Y/N. Please provide details.

25. The range regulations have been drafted to facilitate different models of range control emerging in the future, and separate out the different functions that a range control licensee might provide such as issuing of notifications or monitoring of hazard areas. Note though that our intention is to ensure that there is a single range licensee providing services for a launch operation, rather than allowing multiple licensees to work together to provide different elements of the range control services needed for that launch. This is to ensure that there is a single point of accountability, given the safety-critical nature of range control services. The Act however does allow a range licensee to use another organisation to provide additional range services as its agent through sub-contracting under their licence.

    Do you agree that there should be a single licensee providing the range control service for a launch operation?

    Y/N. Please provide details.

26. The proposed licensing model for range control allows an applicant to apply for a licence based on their proposed operation and the equipment, personnel and qualifications needed to provide it. Therefore, if the applicant wished, they could apply for a licence based on these attributes ahead of identifying the designated site that they intend to operate from, and identify this site at a later date. The regulator would still need to assess the licensee to be assured that their services will operate effectively from the designated site. This could be desirable for applicants in that it allows greater flexibility and reduces barriers to enter the market, but some concerns have been raised that this introduces greater uncertainty into the licensing process in that it means site-specific assessments will be happening later in the process, and potentially closer to the time of launch.

Do you think that the system should allow a range licence to be awarded without the designated site being identified?

Y/N. Please provide details.

27. Do you think that the requirements to ensure the independence of the range function are proportionate?

Y/N. Please provide details.

28. Are there any other ways of ensuring this independence?

Y/N. Please provide details.

29. Are there any other considerations you think the range control regulations and associated guidance should address?

Y/N. Please provide details.

Part 7: Training, qualifications and medical fitness

30. Do you have any comments on regulation 61 “responsibilities of licensees” (and dependant training regulations)? We are particularly interested in whether you think the training requirements should concentrate solely upon the listed relevant individuals (i.e. those who must be qualified).

Y/N. Please provide details.

31. Do you think the requirement for licensees to keep their training, qualifications and medical fitness records for at least two years beginning on the first day of the calendar year after they were created is appropriate?

Y/N. Please provide details.

32. The Regulations (see regulation 73(5)) currently only mention the need for the operator to perform simulations prior to launch to demonstrate safety. Do you think this should include rehearsals?

Y/N. Please provide details.

33. Do you have any comments on the type of rehearsals or simulations that are/could be required?

Y/N. Please provide details.

34. Are there any other considerations you think the training, qualifications and medical fitness regulations or associated guidance should address?

    Y/N. Please provide details.

Part 8: Safety of operator's spaceflight activities during the launch operator licence or the return operator licence

35. Is it clear to whom these safety regulations will apply?

    Y/N. Please provide details.

36. Is it clear where a spaceflight activity will begin and end to which these safety regulations will apply?

    Y/N. Please provide details.

37. Do you have any comments with regards to the definition of 'flight' or the 'flight envelope' for the purposes of regulations 92, 103, 104, or paragraph 19 of Schedule 5?

    Y/N. Please provide details.

38. With regard to the events and matters set out in regulation 83, are there any other instances or occurrences that you think should necessitate a review and/or revision of the safety case and risk assessment?

    Y/N. Please provide details.

39. Are there any other considerations you think should be accounted for regarding the roles of the safety manager, accountable manager, launch director or the flight termination personnel, or that guidance should address?

    Y/N. Please provide details.

40. Is a technical requirements specification a suitable basis for the spaceflight operator to present the essential requirements of the launch vehicle and ground support equipment?

    Y/N. Please provide details.

41. If you answered no, please say which document(s) should be referred to or might be used instead of a technical requirements specification.

42. Do you agree that regulation 97 allows for an appropriate verification and validation approach to be taken in relation to a spaceflight activity?

    Y/N. Please provide details.

43. Pre-launch preparation of the launch vehicle and spaceport involves a number of activities, from maintenance of the infrastructure to loading of propellant onto the launch vehicle and/or satellite. How do you foresee these responsibilities being split between the launch operator and spaceport licensees? Please provide details

44. How do you foresee the safety responsibilities for pre-launch activities being reflected in the respective safety cases for launch operator and spaceport licensees?

    Please provide details.

45. Regulation 102 details the conditions for commencing the spaceflight activities ranging from the need to confirm that the launch vehicle is fit for operator's activities to the procedures for launch authorisation. Do you have any comments on the conditions for commencing the operator's spaceflight activities?

    Y/N. Please provide details.

46. Concerning regulation 103 (during flight: monitoring and termination) do you think it is reasonable to require a launch operator to monitor the launch and flight of their vehicle in real-time so as to be aware of a vehicle malfunction?

    Y/N. Please provide details.

47. Should the requirement be for the monitoring to be done only if necessary to carry out the spaceflight activity safely (e.g. the operator sets out in the safety case why such monitoring might not be necessary)?

    Y/N. Please provide details.

48. Do you envisage any additional duties/responsibilities of the flight termination personnel?

    Y/N. Please provide details.

49. Do you think it is likely that a launch vehicle returning from orbit will need a flight safety system and therefore might also need monitoring for the purpose of detecting malfunctions so that flight termination personnel may take action to safely terminate the flight (assuming there is no automatic flight safety system installed in the launch vehicle)?

Y/N. Please provide details.

50. Referring to the sequential mission phases covered by regulations 102, 103 and 104 and the guidance provided, is the intent and purpose of these regulations clear?

    Y/N. Please provide details.

51. Regulation 104 and Schedule 1 identify a number of requirements for parts of the launch vehicle that reach orbit or for any sub-orbital launches that interfere with the space environment. These seek to minimise the interference of the spaceflight activity with other space objects and ensure the operator considers aspects such as space debris mitigation in their mission. Do you have any comments about the requirements relating to the launch vehicle during operator's spaceflight activities?

    Y/N. Please provide details.

52. Do you understand the link between these regulations and the spaceflight operator's safety duty set out at regulation 82, in as far as the regulations refer to the operator's spaceflight activities being carried out safely?

    Y/N. Please provide details.

53. In the Regulations the scope of activities considered under the return operator licence are outlined. Do you have any comments about the type of activities envisaged under the return operator licence?

    Y/N. Please provide details.

54. Are there any other considerations associated with the safety of the operator's spaceflight activities that the launch operator licence or the return operator licence regulations or associated guidance should address?

    Y/N. Please provide details.

Part 9: Spaceport safety

55. Do you think the maximum period of five years in paragraph 1 of regulation 143 is a suitable interval between reviews (and, where necessary, revision) of the safety case?

    Y/N. If you answered no, what do you think would be a suitable interval? Please provide details.

56. Are there any circumstances not already covered in paragraph 2 of regulation 143 that you think would result in a review of the safety case?

Y/N. Please provide details.

57. Is three years a suitable interval between emergency response plan testing?

    Y/N. If you answered no, what do you think would be a suitable interval?

    Please provide details.

58. Are there any other considerations you think the spaceport safety regulations or associated guidance should address?

    Y/N. Please provide details.

Part 10: Security

59. Do you have any comments on the draft security regulations?

    Y/N. Please provide details.

Part 11: Informed consent

60. Regarding regulation 197, a maximum time limit of one-month has been established because information provided before that time is more likely to be out of date. The minimum period to examine the information and ask questions has been established as 12 hours. Do you agree with this approach or should some other time limits be established?

    Y/N. Please provide details.

61. If you do not agree, what balance, in regard to these time-limits, do you see as adequate between the needs of the licensee versus the needs of the participants?

    Please provide details.

62. Do you think the requirement for the human occupant to sign the consent form not more than 24 hours before taking part in spaceflight activities is suitable?

    Y/N. Please provide details.

63. The draft regulations do not require a witness to the signing of the consent form. Do you agree with this approach? Y/N/don’t know

64. Do you think the regulations and associated guidance capture everything that is needed to properly provide informed consent for spaceflight activities?

Y/N. Please provide details.

Part 12: Liabilities and indemnities

65. Are there any other persons you think should be included in the scope of regulation 206?

Y/N. Please provide details.

Part 13: Monitoring and enforcement

66. Are there any other considerations you think the monitoring and enforcement regulations or guidance should address?

Y/N. Please provide details.

Part 16: Duty to inform the regulator

67. Part 16 outlines provisions that apply to any information provided by a relevant person. There are also specific obligations in other regulations that create a duty for licensees to inform the regulator of changes. Do you agree that the general provision in regulation 270 should exist in addition to the specific obligation in other regulations?

Y/N. Please provide details.

The Spaceflight Activities (Investigation of Spaceflight Accidents) Regulations

68. Are there any other considerations you think the accident investigation regulations or guidance should address?

Y/N. Please provide details.

The Space Industry (Appeals) Regulations

69. Are there any other considerations you think the appeals regulations or guidance should address?

Y/N. Please provide details.

Impact Assessment

70. What is your organisation?

a) a spaceport

b) a range control service provider

c) a launch operator

d) an orbital operator

e) a trade body

f) a union

g) a user of launch or satellite services e.g. imagery

h) an academic institution

i) an international body or group

j) an environmental group or organisation

k) an insurance, banking or finance company

l) a foreign government

m) an individual

n) another type of business or organisation

71. Is your organisation considering applying for a licence under the Space Industry Act 2018?

Y/N.

72. Which of the UK launch forecast scenarios in Annex 3 of the accompanying Impact Assessment do you think is most realistic? Please choose one option.

a) Low

b) Central

c) High

d) None of the above

e) Not sure

73. If you answered ‘none of the above’ to question 72, please explain why including evidence if possible.

74. Have any stakeholders affected by the proposed secondary legislation not been captured in the accompanying Impact Assessment?

    Y/N.

    Please provide details, including the details of these stakeholders and how they may be affected, and costs and/or benefits in £ if possible or qualitative costs and/or benefits if not monetisable.

75. Will your organisation have to purchase any equipment or systems to comply with the proposed secondary legislation?

    Y/N. Please provide details, including estimated costs in £ if possible or qualitative costs if not monetisable.

76. Will you or your organisation have to implement or change any processes to comply with the proposed secondary legislation?

    Y/N. Please provide details, including estimated costs in £ if possible or qualitative costs if not monetisable.

77. Are there any benefits associated with the proposed secondary legislation that are either misrepresented or not captured in the accompanying Impact Assessment?

    Y/N. Please provide details, including estimated benefits in £ if possible or qualitative costs if not monetisable.

78. Are there any costs associated with the proposed secondary legislation that are either misrepresented or not captured in the accompanying Impact Assessment?

    Y/N. Please provide details, including estimated benefits in £ if possible or qualitative costs if not monetisable.

79. Will you or your organisation familiarise themselves with the secondary legislation and accompanying guidance?

    Y/N.

80. If you answered ‘yes’ to question 79, please provide details of the type and number of employees you expect to familiarise themselves with the secondary legislation and accompanying guidance for your organisation.

81. If you answered ‘yes’ to question 79, please also include an estimate of how long you expect this take (in working days) and an estimate of the cost in £ if possible.

82. If you answered ‘yes’ to question 79, what type and number of employees do you expect to engage with the regulator on behalf of you and/or your organisation during:

    a) The licensing process

    b) The regulator’s monitoring regime

83. If you answered ‘yes’ to question 71, how long (in working days) do you expect you and/or your employees in your organisation to spend on:

    a) Engaging with the regulator during the licensing process

    b) Engaging with the regulator to monitor compliance

84. If you answered ‘yes’ to question 71, what type and number of people are you likely to designate and/or employ for the prescribed roles set out in the proposed secondary legislation? Please provide details, including associated cost estimates in £ if possible or qualitative costs if not monetisable.

If you would like further copies of this consultation document, it can be found at https://www.gov.uk/dft#consultations or you can contact the department if you need alternative formats (Braille, audio CD and so on).