UK Civil Aviation Authority

Guidance for Orbital Operator licence applicants and licensees

CAP 2210

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CHAPTER 1
Introduction

1.1 If you want to:

- operate a space object such as a satellite or constellation from the UK
- procure the launch of a space object from the UK, or
- conduct various other activities in outer space from the UK

you need an orbital operator licence under the Space Industry Act 2018 (SIA).

1.2 This guidance document explains how to apply for an orbital operator licence. It tells you about the information you need to provide us, how we will assess your application and how long an application can take. It also summarises the duties you will have as an orbital operator licensee, if your application is successful.

1.3 If you're a UK national or UK-based organisation that wishes to conduct these kinds of activities from **outside the UK**, you need to get a licence under the Outer Space Act 1986 (OSA). More information on how to do this is available in our publication OSA Guidance for applicants (CAP2224).

1.4 In practice, many organisations will need to apply for licences under both the SIA and OSA. This is the case if, for example, you want to procure an overseas launch for your satellite (requiring an OSA licence) but will then operate it from the UK (SIA orbital operator licence), or vice versa.

1.5 If you're not sure which licence to apply for, please contact us by emailing commercialspaceflight@caa.co.uk

CHAPTER 2

Requirement to obtain a licence

2.1 Under the SIA, if you want to carry out space activities, suborbital activities, and associated activities in the UK, you must get a licence.

2.2 There are different types of licence covering different activities.

- If you want to operate a space object in orbit, procure the launch of that space object, or conduct any other activity in outer space, then you need an **orbital operator licence**. The most common examples of activities that would be licensed under an orbital operator licence are the procurement of a satellite launch, and the operation of a satellite. Orbital operator licences are also required to cover any in-orbit servicing, manufacturing or active debris removal activities to be carried out by a satellite.
- If you want to launch a rocket or other spacecraft from the UK (including UK territorial waters) above the stratosphere, you need a **launch operator licence**. This is for a launch that involves a vehicle launched vertically from a licensed spaceport, released from a carrier aircraft, and for suborbital spaceplanes and balloons. The same licence can cover a single launch, or a series of launches. If you also plan to return the launch vehicle to land in the UK, you do not need to apply for a separate return operator licence.
- If you want to return a launch vehicle that was launched into orbit from outside the UK to land in the UK, you need a **return operator licence.** However, if you want to return a satellite to land in the UK, then you will need to get an **orbital operator** licence.
- If you want to provide range control services in relation to spaceflight activities, you need a **range control licence.**
- If you want to operate a spaceport – i.e. a site from which spacecraft or carrier aircraft can be launched or a site at which controlled and planned landings of spacecraft can take place – then you need a **spaceport licence**.

2.3 If you want to carry out different licensed activities – for example, to launch a vehicle that is carrying satellites, and then operate one or more of those satellites in outer space – you may need to apply for separate licences for each activity. Or if part of a launch vehicle is designed to remain in outer space and can be operated in orbit to carry out additional activities, the launch operator may need to obtain an orbital operator licence. The requirement to hold both licence types will be determined on a case-by-case basis, taking into account safety and

security considerations specific to the proposed mission. If you think this could apply to your proposed activities, please contact us to confirm the requirements. Email commercialspaceflight@caa.co.uk.

How to get a licence

2.4 To get any of these licences, you need to apply to the CAA. We are the UK's spaceflight regulator.

2.5 The application process is slightly different for each licence type, but there are some core requirements.

2.6 This guidance document explains how to apply for an orbital operator licence and what information you have to provide. It also tells you about how we will assess your application and how long an application can take.

2.7 If you already hold a licence under the OSA or SIA, and are now planning to apply for an orbital operator licence to operate another space object, you are encouraged to let us know as soon as possible by emailing commercialspaceflight@caa.co.uk. We can let you know what information from your existing licence / previous application may be relevant to your new application. The same applies if you have begun one application and are now starting a new application for a separate mission.

Application fee

2.8 When applying for an orbital operator licence, you will have to pay a fee. To see the current fees, please visit https://www.caa.co.uk/space/licences-and-permissions/orbital-operator/. The fee is for the application; paying it does not guarantee that licence will be granted.

2.9 If your licence application is rejected, or you withdraw it, you will not get a refund on the application fee. You will also not be permitted to transfer the payment to another application

2.10 There is no charge for applying for a range control, spaceport, launch operator or return operator licence.

Our approach

2.11 As the regulator we enable space activities which are safe for the public, in line with UK national security and interests and meet the UK's international obligations.

2.12 To do this, we review a range of information about your organisation and the space activities you want to undertake. We need to understand how you propose to undertake those activities, and what steps you will take to ensure that the risks associated with the activities are as low as reasonably practicable (ALARP). We

know that there are lots of different mission profiles and technologies used in orbital activities, so we examine each application individually, focusing on the outcomes you are trying to achieve and how well you demonstrate you can achieve those.

2.13 We are keen to help applicants provide the right information. So, we strongly encourage you to contact us before you apply and talk to us about your plans. In this pre-application phase, we can provide a range of support and guidance, including workshops on key aspects of the application.

2.14 When you're applying for an orbital operator licence, you can also use the 'Traffic Light System' to get an early (and non-binding) indication of whether your proposed activities appear to pose an acceptable level of risk to safety, security and sustainability. This is free of charge and can help you decide whether to continue with the application as it is currently planned, or make changes to your proposals, to increase the likelihood of getting a licence.

2.15 Once you have applied, we are likely to ask you additional questions about your proposals. We may want to examine documentation, visit sites operated by you or by any sub-contractors, see prototype space objects and launch vehicles or get demonstrations of technology and systems you propose to use. Our rights to do this are set out in the SIA and Space Industry Regulations (the Regulations). We will treat all information you give us as commercially sensitive.

2.16 Once you get a licence, you are responsible for ensuring your space activities comply with the conditions of the licence and the reporting plan we send you when we issue the licence. You can read more about what this means in chapter 6 of this guidance, Duties of an orbital operator licensee.

2.17 We will conduct regular monitoring and inspections to check everything is going as planned for your space activities. We do have enforcement powers, which we can use if we identify anything that was not in line with the approved plans, or where we have reasons to be concerned about safety.

What you need to know

2.18 This document is intended for guidance only. You should read it alongside the SIA, the Space Industry Regulations and the Regulator's Licensing Rules.

2.19 For full definitions of some of the terms used in this guidance, see the SIA and the Regulations, in particular regulation 2. However, there are some definitions elsewhere in the SIA and Regulations.

2.20 This guidance focuses on what applicants and licensees are required to do under the SIA and Space Industry Regulations. Depending on what activities you are planning, you may also be required to meet requirements under other laws

and regulatory regimes. It is your responsibility to identify which other regulatory requirements apply to your operations. During the pre-application phase, we can highlight some other issues that may be relevant to your activities, but we can't advise you on how to meet other regulators' requirements.

CHAPTER 3

Applying for an orbital operator licence: overview

What you will need to do

3.1 When applying for an orbital operator licence, you will need to:

- complete the standard online application form, including providing details of your company's legal status, financial and technical resources. The form is available through https://portal.caa.co.uk/. You have to register with the CAA to get access to the portal. For more details of what is required in completing this standard form, read the separate guidance on Applying for a licence under the Space Industry Act 2018 (CAP2209)
- pay the application fee
- answer the technical question set which examines your proposed space activities and how you will ensure they are conducted as safely and sustainably as possible. This consists of more than 140 questions. In support of your application and answers, you will need to include detailed technical information about the space object and how you will operate it.
- answer the Radio Frequency / Spectrum Question Set. This is a brief factual questionnaire. Your answers will be shared with Ofcom, the UK's communications regulator.
- provide information about the individual who will be your accountable manager
- provide evidence of the insurance cover you have, or will have, in place. This must meet the levels set out on our website as a minimum, but the exact amount will be detailed in a licence condition.
- submit a draft cyber security strategy for your proposed activities, and the cyber security risk assessment on which the strategy is based. These should not be submitted via the CAA's online portal. Please contact commercialspaceflight@caa.co.uk to arrange how your information will be delivered to the security assessment teams.
- assess whether your proposed activities may give rise to issues of national security. Broadly, orbital operations are likely to give rise to issues of national security where:
    - sensitive or classified information is involved, or
    - where the operator, the asset being licensed, or the mission management facility are designated as critical national infrastructure.

If the proposed activities may give rise to any issue of national security, you must also:

- appoint a security manager and provide information about the individual who will fulfil this role
- submit a draft security programme in line with the requirements of regulation 171 and a draft site plan, including proposals for security restricted areas, where applicable.

3.2 You will need to submit your application and supporting evidence at least six months ahead of when you would like your licence to be issued. If your activity is novel or complex, a minimum of 12 months will be required. If there are any gaps in the information you submitted, we can't progress your application until we receive the missing information.

Exceptional circumstances: the need for a safety case

3.3 In the majority of applications for an orbital operator licence, we won't need you to supply a safety case: the answers to the technical question set will be sufficient. However, for novel, complex or especially dangerous operations, we can require you to compile a full safety case to enable us to assess whether the risks associated with your operations have been reduced to as low as reasonably practicable (ALARP).

3.4 We strongly recommend that, if your proposed operations involve novel technology or otherwise appear complex, you contact us as early as possible, before you start your application. We can then tell you if we think that a safety case may be necessary. Email commercialspaceflight@caa.co.uk

3.5 If we do require a safety case, we will offer you a workshop on how to produce one.

Working with other licensees

3.6 Because some of the technical questions relate to how your space object will be launched, you will need to work with the launch operator to obtain information to include in your answers. In addition, if you intend to use an orbital manoeuvring vehicle (OMV) operated by a different orbital operator licensee, you may need to work with that licensee.

Use of agents

3.7 If you are considering using an agent – i.e. a third party to carry out specific activities on your behalf – you must provide details of them in your application, including:

- a detailed description of the spaceflight activities that the agent will carry out and evidence that the agent is capable to carry out the activities, and

- any applicable agency contracts.

3.8 If you use an agent, you are ultimately responsible for ensuring the agent can provide the specified services to the correct specification and service level agreed.

How we will assess your application

3.9 We can grant a licence as we see fit, but **only** if we are satisfied that the proposed activities:

- will not jeopardise public health or the safety of persons or property
- will not undermine national security
- will not compromise the UK's ability to carry out its obligations under the various international treaties and agreements that govern space activities, including treaties regarding the responsible use of space, or otherwise impact on UK national interests.[1]

3.10 To assess these matters, we examine the information you provide in your application. We can also request further information or clarification during the assessment process.

3.11 We will seek evidence of:

- the suitability of your insurance cover for the mission
- whether you have adequate financial resources to carry out the proposed activity and to meet and maintain the obligations under the licence (e.g. continuing to meet insurance premium payments)

3.12 We will also conduct technical assessments, based on your responses to the technical question set, to ensure that the launch and operation of the space object conform with international law (e.g. laws regarding the responsible use of space, including the need to avoid harmful contamination of space) and that you have taken all relevant steps to reduce the risks of your activities to as low as reasonably practicable (ALARP) and that the residual risk is acceptable.

3.13 Once we are satisfied from the technical perspective, we will liaise as appropriate with government departments and partners (e.g. Ministry of Defence) to ensure that your proposed activities will not affect government activities.

3.14 We may also ask for further information from you, or request to inspect sites, launch vehicles or payloads.

[1] See https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html

3.15 At all stages of the licensing process, we will keep you informed and explain the reasons for any decisions or for any additional requests for information.

3.16 If your application satisfies all requirements, your case manager will present the conclusions to our space leadership team. Our Head of UK Space Regulation makes the final decision on any licence application and proposed conditions.

3.17 After we've completed our assessment, we check if the licence conditions are contrary to the interests of government departments and other agencies. This is a statutory consultation and it will take four weeks. You will also have the opportunity to comment on the proposed conditions at this stage.

3.18 If there are no objections from the statutory consultation, we then must get consent from the Secretary of State to grant the licence. For OSA and orbital operator licences, consent is delegated from the Department for Science, Innovation and Technology (DSIT) to the UK Space Agency.

Granting a licence

3.19 We will write to you to inform you of our decision.

3.20 If your licence has been granted, you will be sent the licence (electronic or paper format). The licence will set out any conditions we have placed on the licence. We will also provide written reasons for including those conditions.

3.21 The licence is effective immediately from the date of the grant of the licence, or as otherwise stated in a condition on the licence. The duration of the licence will be set out in the licence itself.

3.22 If your application has been refused, we will write to you to confirm this and explain why. Your application fee will not be refunded.

3.23 Under section 60 of the SIA and Schedule 10, you can appeal against:

- a decision to refuse an application for a licence
- a decision to grant a licence subject to conditions.

3.24 The Space Industry (Appeals) Regulations apply in such cases. For further details, see the separate document Guidance on appealing decisions made under the Space Industry Act 2018 (CAP2216).

Duties after you get a licence

3.25 If you get an orbital operator licence, there are some additional things you must do to remain compliant with that licence. These include obtaining insurance cover to the amount specified as a licence condition, if you have not already done so, and providing us with specific information relating to the launch of your space object. This refers to information that was not available, or not confirmed, at the time you applied for a licence – such as the date of a launch operation.

3.26 You need to provide us this information before a launch. After a launch, you may also need to provide additional information to the Secretary of State, to be included in the UK's registry of space objects.

3.27 You will also need to meet any conditions that we placed on your licence, when we granted it.

3.28 These duties are covered in chapter 6 of this guidance, Duties of an orbital operator licensee.

Legislative background

3.29 Sections 8 and 9 of the SIA set out some core requirements that any applicant for an orbital operator licence must meet.

3.30 Section 8 (Grant of a Licence) defines the circumstances in which we can grant a licence and the standard information required. The Regulator's Licensing Rules (CAP2221) detail this standard information we need.

3.31 Section 9 identifies the core principles in relation to safety, that we must be satisfied the applicant meets before we can grant a licence. Specifically, Section 9(4) is of primary relevance to applicants for an orbital operator licence. It requires an applicant to have taken all reasonable steps to ensure that risks to health, safety and property are as low as reasonably practicable (ALARP).

3.32 For orbital operator licences, there are no additional regulations that set out how an applicant must demonstrate that they have done this, or are capable of doing so. Instead, we use the technical question set to understand more about the proposed activities and the approach that each applicant has taken, or will take, to ensuring that the risks are ALARP.

3.33 This approach has been chosen because of the wide diversity of mission profiles and technologies used in orbital activities. It allows new developments in recognised standards and practices to be taken into account and safety and security requirements to be set to target the specific concerns associated with a given activity. A similar approach has been used in granting licences under the OSA.

3.34 Though there are no additional safety regulations around orbital operations, applicants for an orbital operator licence must meet requirements in:

- part 11 of the Regulations, relating to security (particularly cyber security), and
- part 13 of the Regulations, relating to insurance, liabilities and indemnities.

3.35 After getting a licence, orbital operator licensees must also meet further requirements in part 11 and part 13, plus requirements in:

- part 14 of the Regulations, relating to enabling us to monitor licensed activities

- part 16 of the Regulations, relating to occurrence reporting.

3.36 Further, if there are any material changes to operational processes, activities or personnel, orbital operator licensees must inform us, as detailed in part 17 of the Regulations.

CHAPTER 4

Pre-application support and the traffic light system

4.1 All applicants for a licence under the SIA are encouraged to engage with us before submitting their application, to talk about your plans and ask questions about the licensing process. A key aim of this is to help you provide the right information when you apply.

4.2 You can contact us with any questions by emailing commercialspacelflight@caa.co.uk

4.3 Any guidance you receive from us before applying will **not** form part of our decision-making process for the licence application.

The traffic light system

4.4 Before applying for an orbital operator licence, you can also use the traffic light system. This is an optional pre-application process, available free of charge, where you answer a series of questions about your organisation and proposed activities. Based on your answers, we give you an indicative rating of red, amber or green for your application.

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

This is summarised in figure 1 below.

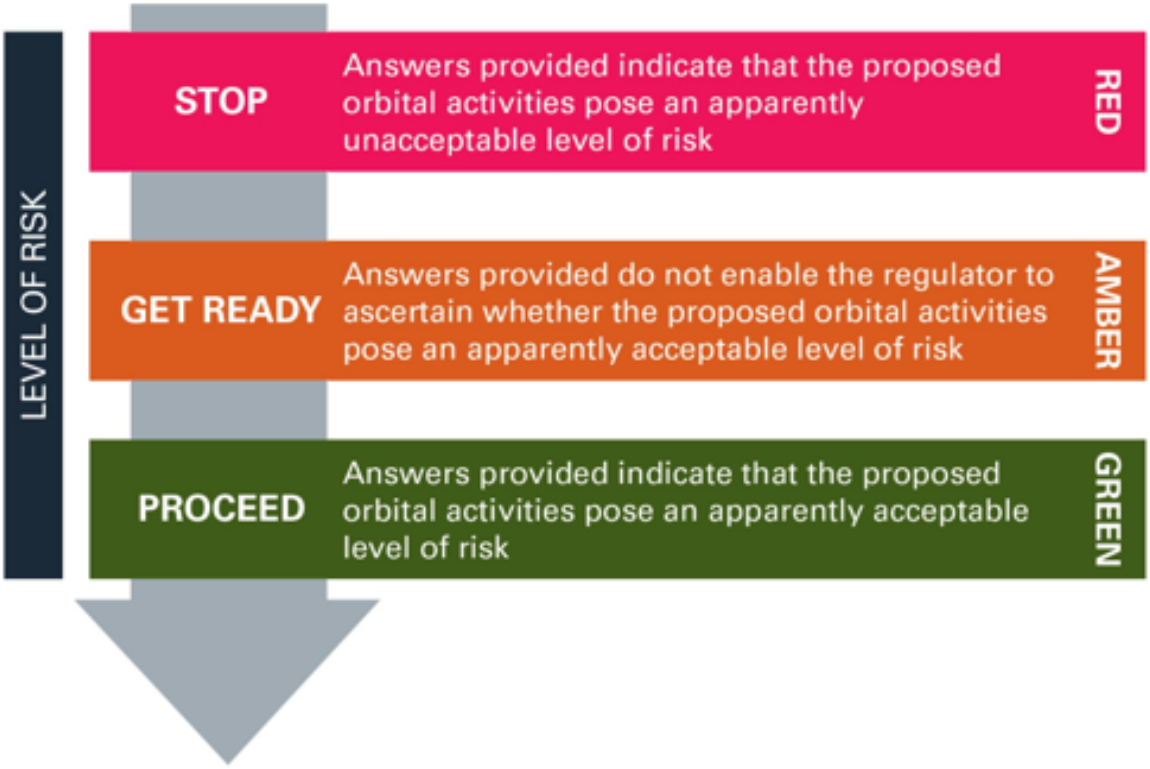

Figure 1: The traffic light system

4.5 We also provide some written feedback on your answers and our rating.

4.6 The aims of the traffic light system are to:

- help new, or less experienced operators, to understand the safety, security, responsibility and sustainability requirements of our licensing process
- help you understand if you are ready to apply and the barriers you may face at an early stage, where re-design of the proposed mission concept is less onerous
- help you determine whether to proceed with an application, including paying the application fee: the traffic light system is free of charge.

A similar process has been used for licence applications under the OSA.

4.7 There is no obligation to use the traffic light system, and you can apply for an orbital operator licence without having first received a traffic light rating. However, new operators, and all operators hoping to launch new types of missions, may benefit from using the system to identify potential issues at an early stage.

IMPORTANT: the ratings we give through the traffic light system are non-binding: a green rating does not guarantee you would get a licence. Our decision will always be based on the actual application, and any issues arising from it.

4.8 Further, the traffic light system only focuses on safety, security, responsibility and sustainability. It does not consider any of the other information which is required as part of an application, whether under the Regulator's Licensing Rules or the Regulations. If you do not meet those additional requirements when you make your formal application, it is unlikely that a licence will be granted, even if you received a "green" assessment.

4.9 We will only begin to consider an application once we have received the correct form, the fee, and all necessary information.

CHAPTER 5

Applying for an orbital operator licence: in detail

5.1 When you apply for an orbital operator licence, you will need to:

- provide evidence that you have the financial and technical resources to provide the services the licence would authorise
- answer the Radio Frequency / Spectrum Question Set
- demonstrate how you will work to ensure your operations are safe and that risks have been reduced to as low as reasonably practicable (ALARP).

5.2 This section focuses on the third of these points.

5.3 We use a technical question set as the basis for assessing this. This asks you to provide details of your mission, so we can understand the activities that would take place under the licence, and then includes a series of questions about **safety** relating to each stage of the operation:

- before and during launch
- during the main operational phase
- at the end of life
- in relation to the space segment
- in relation to the ground segment.

5.4 The technical question set also asks questions regarding the potential impact of the space object on the **sustainability** of the orbital environment.

5.5 The following sections explain what sort of information we will expect to see in your responses and why we need it.

5.6 The technical question set may change over time, to reflect new technologies, standards and issues. Before you submit your application, you should check that you are answering the most up-to-date version of the technical question set. If you are in any doubt, please email commercialspaceflight@caa.co.uk.

5.7 In addition to the core requirements at 5.1, you may also have to meet requirements relating to **security**, if your proposed operations may give rise to issues of national security.

Safety

5.8 Our primary duty under the SIA is securing public safety. In support of that, before granting a licence we must be satisfied that you have taken all reasonable steps to reduce risks from your orbital activities to the health, safety and property of persons to ALARP, and that the level of residual risk is acceptable.

5.9 This means:

- you need to provide us evidence that you have sought to make the risks from your operations ALARP, **and**
- we need to be satisfied that the operations present an acceptable level of risk overall.

In other words, even if you have provided evidence that shows you have taken all reasonable steps to make the risks ALARP, we could still reach the view that the proposed operation presented an unacceptable level of risk.

ALARP is a central concept in UK health and safety law. It is widely adopted within safety engineering good practice and across many sectors as a proportionate approach to safety management. For a more detailed explanation of what ALARP means and how you can demonstrate that you have taken all reasonable steps to reduce risks to ALARP, see Appendix 1 of this guidance.

5.10 For orbital operations, we use your answers to the technical question set, along with other interactions such as inspections and discussions with us, to assess this during your application. The technical question set gives you the opportunity to, among other things:

- demonstrate how your chosen launch operation(s) have been planned to minimise the risk to public safety and the impact on the orbital environment.
- describe the space object you intend to operate in orbit, including appropriate design standards, functionality and capability during all mission phases including launch
- explain the plans, procedures, rules and criteria you will put in place to ensure safe operations during all mission phases, and how you will adhere to them
- describe the role of ground-based elements of the spacecraft system in ensuring safe operations during all mission phases.
- set out where your operation meets international standards and guidelines on spacecraft and launch vehicle design, qualification, operation and disposal, testing and ground segment and mission operations.

5.11 Your answers should include references to identified risks where appropriate, explain the severity of those risks (and where relevant, how you have assessed that severity), and summarise the measures you will use to control those risks, so that they are ALARP.

5.12 We can also use inspections and ask you for further information to help us assess whether you have taken reasonable steps to reduce risks to ALARP.

Sustainability

5.13 Activities licensed in orbit are required to be sustainable. Very broadly, this means that we need to be satisfied that any activities we licence today won't compromise the ability of subsequent generations to embark on activities (or missions) to meet their own requirements in the future.

5.14 In this understanding, sustainability is inherently linked to safety and security. Whereas safety and security look to mitigate impacts of spacecraft activities on the operations of existing spacecraft, sustainability attempts to mitigate the impacts of spacecraft activities on the orbital environment.

5.15 These issues are addressed in the final section of the technical question set, where you are asked to explain (among other things) how you will:

- prevent on-orbit break-ups, either from collisions with other objects in orbit or fragmentation
- limit the number of objects released during normal operations
- remove all space objects, including launch vehicle upper stages, orbital manoeuvring vehicles and satellites, that have reached the end of their operations from all areas designated as protected by the Inter-Agency Space Debris Coordination Committee (IADC).

5.16 These are the same issues that operators licensed under the OSA have had to address.

5.17 In addition, for some orbital missions, the Secretary of State's Guidance to the regulator on environmental objectives relating to the exercise of its functions under the Space Industry Act 2018 may also have to be taken into account. This is something we will seek to identify as soon as possible in relation to any proposed licence application – ideally at the pre-application stage. The guidance will be applied proportionately on a case-by-case basis.

Responsibility

5.18 All activities licensed in orbit must be performed in a responsible manner throughout the duration of the mission. This requires licensees to act responsibly by attempting to minimise risks and taking accountability for the mission's activities and its impacts.

5.19 In your application, you must demonstrate to us how you will:

- avoid breaching the UK's international obligations, including but not limited to international registration and liability obligations
- not cause or be perceived to cause undue financial or reputational risk to the UK and work with the UK Government to ensure that these risks are mitigated appropriately
- be proactive in ensuring compliance with any conditions we place on your licence, as well as identifying any issues or necessary changes that you need to inform us of, and communicating with us in a timely manner
- work proactively to improve orbital safety and sustainability.

Security

Cyber security

5.20 When applying for an orbital operator licence, you must submit a draft cyber security strategy for your proposed activities, and the cyber security risk assessment on which the strategy is based. The cyber security strategy should be appropriate and proportionate for the risk and the type of systems operated.

5.21 For further details, read our publication Guidance on Cyber Security Strategies for applicants and licensees (CAP2535)

5.22 The cyber security strategy and associated documentation should not be submitted via the CAA's online portal. Please contact commercialspaceflight@caa.co.uk to arrange how your information will be delivered to the security assessment teams.

Physical security requirements for all orbital operator licence applicants

5.23 For orbital operators, security relates to:

- ensuring that activities licensed in orbit are secure from any form of interference that could affect the ability to undertake licensed activities safely, and
- adhering to UK national security requirements.

5.24 We will look for evidence that you are taking steps to protect all aspects of your spaceflight activities and associated activities, including any ground-based activities, against malicious external interference that may compromise your ability to control the activity in orbit. Further, you should provide evidence of how you will mitigate the likelihood and impact of malicious events that might occur as a direct or indirect result of a licensed activity.

5.25 In addition, through your application form and the answers to the technical question set, you should demonstrate that:

- your proposed activities will not impair UK national security
- your proposed activities will not actively interfere with the activities of others in the peaceful exploration and use of outer space.

5.26 All applicants must assess whether your proposed activities may give rise to issues of national security. Broadly, orbital operations are likely to give rise to issues of national security where:

- sensitive or classified information is involved, or
- where the operator, the asset being licensed, or the mission management facility are designated as critical national infrastructure.

Additional requirements if your proposed activities may give rise to issues of national security

5.27 If your proposed activities may give rise to any issue of national security, you must also:

- appoint a security manager and provide information about the individual who will fulfil this role (this is covered further in the next section).
- submit a draft security programme for any mission management facility you use, that meets the requirements for a space site security programme set out in regulation 170. (Orbital operators are not required to produce an operator security programme as detailed in regulation 171). This should be based on a security risk assessment, which must also be submitted.

5.28 In support of this space site security programme, you must submit a draft site plan, including proposals for security restricted and controlled areas, where applicable.

5.29 If you do not have a mission management facility, you do not need to produce a space site security programme.

5.30 The extent and detail of your security risk assessment should be appropriate and proportionate to the risks identified with the activity taking place. We can provide more guidance on this at the pre-application stage, including on how to undertake a security risk assessment.

5.31 We recognise that some of these details will depend on the launch operation. That is one reason why you are asked for a draft security programme.

5.32 There is more information on security requirements in the separate document Guidance on security matters for applicants and licensees (CAP2217).

Specific roles: accountable manager

5.33 Under Section 18 of the SIA, licensees must have suitably qualified people in specified roles relating to their licensed activities, by the time they start those activities. For an orbital operator licence, the roles are:

- accountable manager
- if your proposed activities may give rise to any issue of national security, security manager

5.34 When you are applying for an orbital operator licence, you must provide details of the individuals you have appointed, or are intending to appoint, to these roles. This includes information about their qualifications and experience, as well as confirming they meet the eligibility criteria set out in regulations 5 and 6.

5.35 To help you appoint the right people for these roles, we set out the core functions of each role below.

5.36 The **accountable manager** is responsible for establishing and maintaining an effective management system, and for ensuring that your licensed activities can be financed and carried out in accordance with the provisions of the SIA and the Space Industry Regulations.

5.37 Regulation 169 sets out the responsibilities of the security manager. These include acting as the focal point for the security programme and managing the development, administration, and maintenance of an effective security operation for the licensee, with responsibility for physical, personnel and cyber security.

5.38 As well as meeting the basic eligibility criteria (see regulations 5-6), the security manager will have to attain relevant national security clearance before they can take up the post. We can provide more details of this if you need a security manager.

Other roles

5.39 In addition to these two roles, you are encouraged to provide details of the experience, skills and qualifications of any individuals who will play a key role in their operations, in relevant answers to the technical question set. For example, in answers regarding how you would control the object in space and work with the launch operator, you could provide details of the individuals involved.

5.40 We have discretion to require a licensee to appoint someone to fulfil a particular role if we believe it is necessary for the operation(s). An example of such a role is a ‘safety manager’. Any such roles will be set out in conditions in a licence. In practice, however, we will normally advise you, during the application process, if such additional roles are likely to be required.

CHAPTER 6

Duties of an orbital operator licensee

Core duties

6.1 If you get an orbital operator licence, there are various duties you must fulfil to remain compliant with that licence. These include obtaining insurance cover to the amount specified as a licence condition, if you have not already done so, and providing us with specific information relating to the launch of your space object. This refers to information that was not available, or not confirmed, at the time you applied for a licence – such as the date of a launch operation. When we grant you a licence, we'll send you a reporting plan that sets out the minimum information you are required to send us and when.

6.2 You will also need to meet any conditions that we placed on your licence when we granted it.

6.3 In addition, there are some duties that apply to all licensees under the SIA and the Regulations. These can be summarised as:

- providing information to us, so we can fulfil the UK's international obligations to supervise space activities under our jurisdiction
- keeping records of, and in relation to, licensed activities
- reporting occurrences.

6.4 An occurrence in relation to orbital activities is any collision with another space object, any other event that generates space debris, or any incident during or in preparation for licensed activities which, if not corrected or addressed, could result in a platform failure, loss of control of the satellite or risk to other space objects.

6.5 These duties are covered in the document Working with the regulator as a licensee under The Space Industry Act 2018 (CAP2214).

6.6 As well as these core reporting requirements, you must also inform us of any proposed changes to your licensed activities that affect (or might affect) the basis on which we granted the licence. For example, this could mean changes to the concept of operations, the launch site or operator, the ground control station, or the orbital location. You must also inform us of any changes in key personnel.

6.7 If you don't fulfil any of these duties, we can take enforcement action, that could result in you being prevented from providing the licensed services. More details on the action we can take is included in our spaceflight enforcement policy.

6.8 As part of our monitoring, we conduct inspections and site visits. We appoint inspectors to do this.

6.9 Inspectors have a range of powers to enable them to do their work. These include being able examine relevant items, take photographs and samples, request documents etc. They can take materials off site for further examination. They can also bring relevant experts in different matters with them, to assist in their work.

6.10 You are legally required to give inspectors the access they request and not obstruct them in their work.

6.11 Inspectors will, where possible, give you advance notice of any inspection. However, if there is a situation which in the inspector's opinion may be dangerous, or where delay might be prejudicial to public safety or UK national security, they can demand to access a site at ANY time and be granted access without delay.

Registration

6.12 The UK is party to the UN Convention on Registration of Objects Launched into Outer Space 1975 (the "Registration Convention"). The Registration Convention imposes international obligations on 'launching States' to register space objects.

6.13 In line with these, the Secretary of State must maintain:

- a register of launches that have taken place from spaceports in the UK. This includes both space and suborbital launches. (see section 61(1) of the SIA)
- a register of space objects, whether launched in the UK or elsewhere (see section 7 of the OSA, as amended by Schedule 12 of the SIA)

6.14 In practice, these duties have been delegated to us to manage, as regulator.

6.15 To enable us to fulfil these duties, you must provide us with information about each launch, including:

- the date of the launch
- the site from which the launch took place
- the nature of each launch vehicle launched
- the purpose of the launch
- name, designation, and catalogue number of the space objects launched
- orbital position and orbital parameters of the space objects launched
- general function of the space objects launched.

6.16 We can also request further information, as we deem appropriate. The information provided may also be used to notify other international bodies or organisations of UK launches and space objects as is required.

6.17 The registers can be viewed online, free of charge. You can view the UK registry of space objects and the supplementary registry on the CAA website.

Registration of space objects that will be operated from outside the UK

6.18 Prior to the UK launch (including from a UK site, sea or air launch) of a satellite which is to be operated from outside the UK by a non-UK company, we can request written confirmation from the State in which operations are to be carried out that they will be responsible, to the extent appropriate, for the registration of the satellite or be listed as an interested party to the registration.

Appointment of relevant individuals

6.19 Once you have a licence, you must take steps to appoint people to the specific roles detailed in chapter 5 (accountable manager and, if required, security manager).

6.20 These should be the people you nominated as part of your application. If for any reason you can no longer appoint any of them to the roles, you will need to provide us details of the people you now propose to appoint, so that we can check whether they meet the eligibility criteria and are fit and proper for the roles.

Insurance

6.21 Before the launch of a satellite or other space object, orbital operators must hold, or be covered by, an insurance policy that covers:

- the UK Government, the CAA and the people and organisations listed under section 36(2) of the SIA against any claims for damage or loss related to the spaceflight activities authorised by that licence
- the operator against any liability for injury or damage to persons or property, subject to the specified limit on the amount of the operator's liability
- the operator against any third-party liability in respect of the death or injury to any person, subject to the specified limit on the amount of the operator's liability
- the operator against any obligation to indemnify either the UK Government or the listed people and organisations under section 36(2) of the SIA, subject to any limit on the amount of the operator's liability.

6.22 Orbital operators must hold, or be covered by, third party liability (TPL) insurance for their in-orbit operations. Insurance for such operations is generally taken out

on an annual basis. The amount of cover required will be set out in a licence condition.

6.23 The insurance amounts and limits of liability for in-orbit operations for satellites launched from or operated from the UK are different, depending on whether a mission is a standard mission, or a higher risk mission.

- Standard missions – such as those involving a single satellite employing an established launcher, a proven satellite platform, and recognised operational practices – represent very low and well-characterised third-party risks.
- Higher risk missions are those where the mission:
  - is novel in nature or scale, and / or
  - uses techniques, technologies and / or systems which are unproven, and / or
  - presents a higher risk of high-value TPL claims and / or
  - presents TPL risks that are not well-characterised

6.24 A standard mission will – currently – require a €60 million indemnity limit. This figure is subject to ongoing review by the UK Government. The current values can be found on our website at https://www.caa.co.uk/space/guidance-and-resources/insurance-and-liability/. In most cases, we will require that a standard mission is covered by a €60 million 'any one occurrence' third-party liability insurance policy. We can also allow an operator of multiple satellites to place all satellites that count as standard missions onto a single 'any one occurrence' insurance policy.

6.25 For higher risk missions, we can set the liability limit and insurance amount at a higher level.

6.26 It is our decision whether to classify a mission as standard or higher risk.

6.27 In most cases, the insurance must be maintained for the duration of the mission, including for any relevant periods which apply to end-of-life activities. The end-of-life plan could involve, raising / lowering the satellite to a graveyard / lower orbit, passivation and switching the satellite off.

6.28 If the satellite is to remain in orbit, orbital operator licensees must indemnify the Government for any claims even after the insurance requirement ends.

6.29 For further information on insurance requirements, read Guidance on liabilities and insurance (CAP2218).

Security

6.30 If you were required to produce a space site security programme, the security manager must keep the security programme maintained and up to date in response to any material changes of operations, or incidents that occur that require changes to be made to the programme.

6.31 The security manager should review the security programme on an annual basis, from the date the licence has been granted, to ensure that any changes during the year have been captured. They should then provide us with a copy of the most up-to-date version.

APPENDIX 1

Understanding ALARP

Overview

ALARP is a central concept in UK health and safety law. It is widely adopted within safety engineering good practice and across many sectors as a proportionate approach to safety management.

It requires you to identify and understand safety risks related to your operations, then take proportionate steps to reduce those risks so they are as low as reasonably practicable (ALARP).

Fundamentally, ALARP involves answering two questions:

- What more could be done to reduce the risk?
- Why have you decided not to do this?

Answering these questions is an iterative process, which requires the continuous reassessment of risks to see whether the steps taken and alterations made have reduced the risk to a tolerable / acceptable level.

Tolerability of risk

The way ALARP works is often illustrated using a “tolerability of risk triangle” (figure 2), where the risk of fatality or serious harm to people or destruction or serious damage to property decreases, as you move down the triangle.

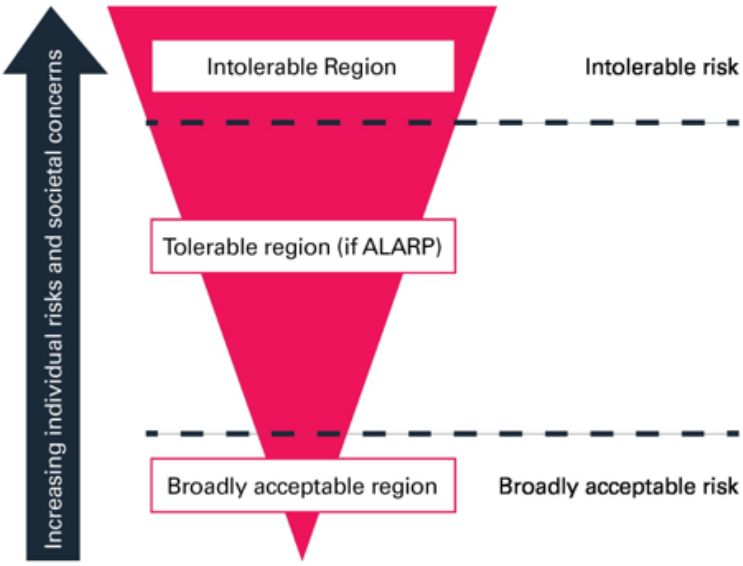

Figure 2: Tolerability of risk

The diagram has three distinct zones, moving up from the bottom of the triangle to the top:

- **Broadly acceptable**: The benefits from the activity outweigh the risks from the activity. In the context of orbital spaceflight operations, these tend to be risks that are inevitable consequences of operating in the space environment, such as major unpredicted space weather events (e.g. coronal mass ejections, etc.) or micro-meteors. These risks cannot be wholly eliminated, so when applying for an orbital operator licence, applicants will need to set out the steps they propose to take to reduce the impact of such events.
- **Tolerable (if ALARP)**: The benefits from the activity are considered to be in balance with the risks, through assessing that the risks have been reduced to ALARP. This means that you as applicant must be willing to take the risk, to receive the benefit, and we – as the spaceflight regulator, focused on public safety – are willing to accept the risk on the basis that you have taken, or will take, all reasonable measures to control the risk. Risks should be reviewed on a regular, ongoing basis, to ensure they still meet the ALARP criteria.
- **Unacceptable**: The benefits from the activity do not outweigh the risks associated with the activity. There is no justification to continue with such an activity. Examples of activities likely to fall into the 'intolerable' region would be where there is a high risk to human health, of generating debris or causing adverse impacts on Earth.

Demonstrating that risks are ALARP

When applying for an orbital operator licence, it is up to you to demonstrate that you have taken steps to reduce the risks associated with your proposed operations to ALARP.

Because it an outcome-based approach to safety, ALARP does not require you to follow specific approaches or mechanisms. Instead, this is something that you are required to demonstrate as a whole, through your application and ongoing safety approach.

In doing this, some useful principles to follow are:

- Consider ALARP by design – the easiest way to demonstrate that you have reduced risks to ALARP is to integrate ALARP thinking from the very earliest phases of the project, even before any mission design has been undertaken.
- Adhere to generally accepted good practice – if you are aware of a standard practice, but have chosen not to follow it, you should explain why.

- Focus on risks and mitigations **specific to the mission** – as well as describing generic risks associated with spaceflight activities, you should specifically identify the risks of your proposed mission and set out associated mitigations. These should take account of both nominal and off-nominal conditions. As the mission is developed, the risks and impacts of the risks might change, including as a result of implementing some mitigations; you should also explain how you will review these as the mission evolves and revise your approach where necessary.
- Explain how mitigations work together – some risks might require multiple mitigations to be reduced to ALARP. You should therefore seek to demonstrate that the mitigations for a particular risk are **collectively** sufficient to have reduced that risk to ALARP.
- Focus on those risks for which you are responsible – where you have identified a risk that will need to be managed to ALARP by a different organisation, you should state this, and indicate what assurance you would seek that they have done so.

Determining whether a control measure is "reasonably practicable"

There is no single answer to whether taking a specific mitigation or control measure is reasonably practicable. In essence, you are required you to consider whether the effort involved in taking the measure – in terms of time, money or difficulty – is grossly disproportionate to the impact the measure would have on reducing the risk. A cost-benefit analysis would be a way to show this.

IMPORTANT: An individual operator's ability to afford a control measure, or the financial viability of a project, is **not** a legitimate factor in the assessment of costs. We cannot take into account the financial position of operators when determining whether risks have been reduced to ALARP. Financial cost is only relevant, where that cost is disproportionately high for a very marginal increase in safety.

How we assess whether risks have been reduced to ALARP

We assess all applications on a case-by-case basis, using the information you provided in your answers to the technical question set, your responses to any further questions we ask you and information gathered during inspections we conduct.

In assessing whether the risks have been reduced to ALARP, we will typically seek evidence that:

- the approach you are taking to make risks ALARP is proportionate to the level of risk in the scenario under consideration
- you have considered all relevant types of risks (orbital operations and re-entry) and the approach you have used to evaluate them is fit-for-purpose

- you have focused on the risks for which you are responsible and specifically addressed any unusual or complex risks arising from the mission profile or design
- your proposals meet all statutory duties
- where you have made any assessment based on “time at risk”, this is given special consideration
- you have considered all relevant control and mitigation measures, starting with the safest (as opposed to the cheapest) option
- you have focused on comparisons with qualitative features related to engineering and other types of relevant good practice, informed as necessary by cost-benefit analysis, rather than the other way around
- where you deem a control measure grossly disproportionate, you explain why and how you have reached that conclusion (including, where appropriate, by including the costs of implementing the measure), and you have also considered partial implementation of that measure.

Evidence of implementation

When considering your approach to risk reduction, we will not only look at the identification of risk reduction, mitigation or control measures, but also whether they have been implemented (or their implementation planned for) in a manner that is likely to be effective. Therefore, you should seek to provide information on how you have implemented, or would implement, different measures.

Assessing whether the residual risks are acceptable

As well as assessing whether the risks have been reduced to ALARP, we must determine that the residual risks associated with your proposed activities are acceptable. To do this, we consider:

- **Policy goals**: We will consider the impact of the proposed spaceflight activity on the UK’s compliance with the UN space treaties to which the UK is a signatory (and any other principles of international law that may be relevant), encourage the protection of outer space as a global commons, and take into account potential consequences for the UK’s relationships with other states.
- **Legal duties & principles:** We must be satisfied that you have taken all reasonable steps to ensure that the relevant risks from your operations are ALARP. We will give priority to public safety when making a licensing decision.
- **Comparisons with other operating states:** Our tolerance for risk will take account of the tolerances of other operating states and generally accepted good practice.

- **Public concern:** We will take account of any public concern surrounding the proposed spaceflight activities.

Further information

Further information on ALARP can be found in the HSE publication Risk management: Expert guidance - ALARP at a glance