UK Civil Aviation Authority

Guidance on applying for a licence under the Outer Space Act 1986

CAP 2224

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Introduction

1.1 If you're a UK national or UK-based organisation that wishes to:

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

you need to get a licence under the Outer Space Act 1986 (OSA).

1.2 This guidance document explains how to apply for a licence under the OSA. It tells you about the information you need to provide us, how we will assess your application and how long an application can take.

1.3 If you want to conduct any of the activities listed in paragraph 1.1 **from the UK**, then you need an orbital operator licence under the Space Industry Act 2018 (SIA). More information on how to do this is available in our publication Guidance for orbital operator applicants and licensees (CAP2210).

1.4 If you're a UK national or UK-based organisation that wishes to operate the same satellite(s) both from the UK and from overseas, then you will need to apply for licences under both the SIA and OSA.

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

1.6 Getting a licence can take some time. We recommend that you submit your application for an OSA licence at least six months in advance of the date that the licence is required.

Chapter 2

Requirement to obtain a licence

2.1 The Outer Space Act 1986 (OSA) is the legal basis for regulating activities in outer space that are carried out from outside the UK, by organisations or individuals in the UK. It exists to ensure the UK complies with its obligations under international treaties and principles covering the use of outer space.[1] These include international conventions around liability for damage caused by space objects and the registration of objects launched into outer space, as well as the principles for the remote sensing of the Earth.

2.2 Under the OSA, any UK national or UK-based organisation that wants to conduct space activities outside the UK must get a licence to do so.

How to get a licence

2.3 To get an OSA licence, you need to apply to the Civil Aviation Authority (CAA). We are the UK's spaceflight regulator.

2.4 This guidance document explains how to apply for an OSA 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.

UK overseas territories

2.5 The OSA also covers individuals and organisations in the following UK Overseas Territories:

- Bermuda
- Cayman Islands
- Gibraltar

and Crown Dependencies:

- Guernsey
- Jersey
- Isle of Man.

[1] These include the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space (often known as the UN Outer Space Treaty) and others listed at https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html

2.6 In these Overseas Territories, you will need to apply to their own Governor's office for an OSA licence. For further details on how to do this in Bermuda and Gibraltar, please see:

- Bermuda Space FAQs
- Gibraltar: OSA licences

OSA or SIA?

2.7 An OSA licence permits you to:

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

2.8 If you want to conduct any of these activities from the UK, you will need an orbital operator licence, issued under the SIA.

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

2.10 There are different application procedures for each licence type.

2.11 If you are not sure which licence you need, please contact us by emailing commercialspaceflight@caa.co.uk

Existing OSA licences

2.12 If you already hold a licence under the OSA or SIA, and are now planning to apply for an OSA 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

2.13 When applying for an OSA 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.

2.14 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

2.15 If you are also applying for an orbital operator licence under the SIA, you will have to pay a fee for that too.

Our approach

2.16 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.

2.17 To do this, we apply the same criteria to assessing applications for a licence under the OSA and under the SIA. That means that when you apply for either licence, 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.

2.18 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.

2.19 When you're applying for an OSA or orbital operator licence, you can also use the 'Traffic Light System' to get an early 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. We will treat all information you give us as commercially sensitive.

2.20 **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. Once you get a licence, you are responsible for ensuring your space activities continue in line with your application. You can read more about what this means in chapter 6 of this guidance.

2.21 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 that anything that was not in line with the approved plans, or where we have reasons to be concerned about safety.

Chapter 3

Applying for an OSA licence: overview

What you will need to do

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

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.

How we will assess your application

3.3 We apply the same criteria to assessing applications for a licence under the OSA and under the SIA. That means 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.[2]

3.4 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.

3.5 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)

3.6 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 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.

3.7 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.

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

3.9 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.

3.10 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.

3.11 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.

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

3.12 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

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

3.14 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.

3.15 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.

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

3.17 Under Schedule 10 of the SIA, you can appeal against:

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

3.18 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

3.19 If you get a licence under the OSA, 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.

3.20 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.

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

3.22 These duties are covered in chapter 6 of this guidance.

Chapter 4

Pre-application support and the traffic light system

4.1 All applicants for a licence under the OSA and/or 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.

The traffic light system

4.4 When you're applying for an OSA 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, sustainability and responsibility.
- An 'amber' rating means that the proposed orbital activities appear to pose an uncertain level of risk to safety, security, sustainability and responsibility.
- A 'red' rating means that the proposed orbital activities appear to pose an unacceptable level of risk to safety, security, sustainability and responsibility.

This is summarised in figure 1 below.

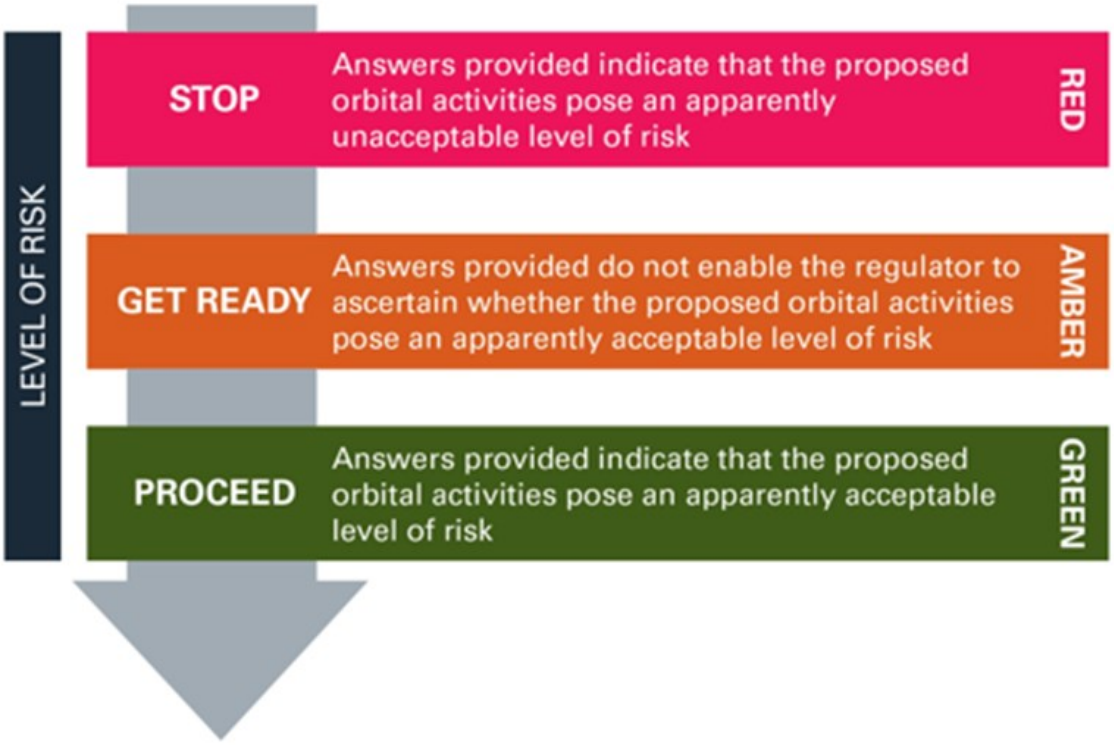

Figure 1: The traffic light system

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.

A similar process is in place for orbital operator licence applications under the SIA.

4.7 There is no obligation to use the traffic light system, and you can apply for an OSA 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. 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 OSA licence: in detail

5.1 When you apply for an OSA 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 rises to issues of national security.

Safety

5.8 When applying for an OSA licence:

- 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.

5.9 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.

5.10 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.

5.11 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

5.12 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.

5.13 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.

5.14 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).

5.15 These are the same issues that operators licensed under the SIA have had to address.

5.16 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

5.17 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.

5.18 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

Requirements for all OSA licence applicants

5.19 For OSA licence applicants and licensees, 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.

5.20 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.

5.21 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.

5.22 All applicants must assess whether your proposed activities may give rise to issues of national security. Broadly, activities 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

5.23 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. 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.
- submit a draft security programme for any mission management facility you use. This should be based on a security risk assessment, which must also be submitted.

5.24 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

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

5.26 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.

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

Chapter 6

Duties of an OSA licensee

6.1 If you get an OSA 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 your activities. 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, once you have an OSA licence, you must:

- allow us to have reasonable access to documents, and to inspect relevant equipment and facilities, so we can monitor whether your activities are being conducted in line with your licence and any conditions on it
- inform us of any planned changes to the licensed activity (e.g. change of orbit, change of owner) and seek approval prior to the change being made
- prevent contamination of outer space and adverse changes in the environment of the Earth
- avoid interfering in the space activities of others
- avoid any breach of the UK's international obligations
- preserve the national security of the UK
- dispose of the licensed space object appropriately at the end of the licensed activity, and inform us that you have done so.

6.4 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.

Insurance

6.5 Before the launch of a satellite or other space object, all OSA licensees must hold, or be covered by, an insurance policy that covers:

- the UK Government, the government of the Crown Dependency or Overseas Territory (where applicable) and the CAA against any claims for damage or loss related to the 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 government of the Crown Dependency or Overseas Territory, subject to any limit on the amount of the operator's liability.

6.6 OSA licensees 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.

6.7 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

6.8 A standard UK 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.

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

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

6.11 Insurance amount requirements may differ in Crown Dependencies and Overseas Territories.

6.12 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.

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

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

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.

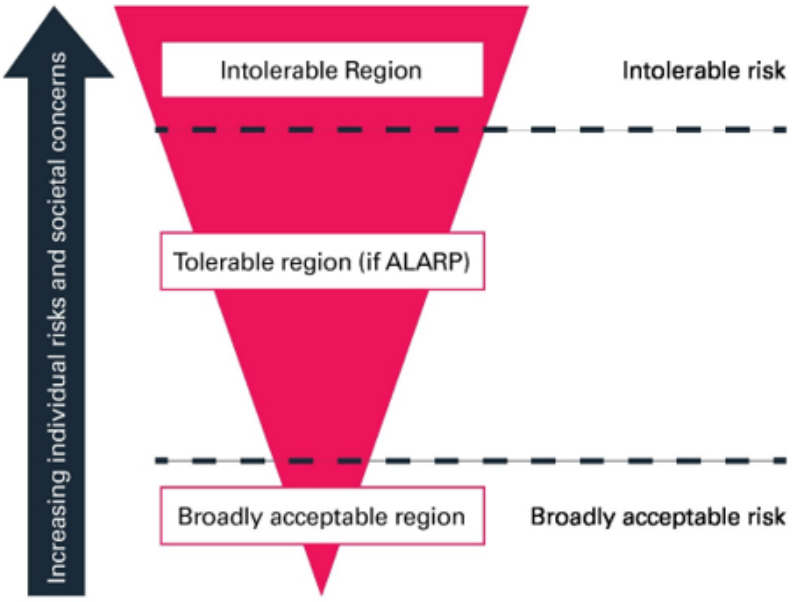

Figure 2: Tolerability of risk

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 spaceflight regulators, 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