

Guidance for the assessment of environmental effects

CAP 2215

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Section 1: Overview of the Guidance

- 1.1 The Space Industry Act 2018 (the Act) regulates all spaceflight activities carried out in the United Kingdom, and associated activities.
- 1.2 The Act requires any person or organisation wishing to:
 - launch a launch vehicle from the UK
 - return a launch vehicle launched elsewhere than the UK to the UK landmass or the UK's territorial waters
 - operate a satellite from the UK
 - conduct sub-orbital activities from the UK
 - operate a spaceport in the UK, or
 - provide range control services from the UKto obtain the relevant licence.
- 1.3 It is supported by [The Space Industry Regulations 2021](#) (the Regulations), that set out in more detail the requirements for each licence, and the [Regulator's Licensing Rules](#), which specify which application form to use to apply for a licence and what information the regulator will require in support of an application.
- 1.4 There is then a series of guidance documents designed to help explain how to comply with the Act and the Regulations. This document is one of the guidance documents.

With the coming into force of [section 1\(3\) of the Act](#), the [Outer Space Act 1986](#) no longer applies to space activities carried on in the United Kingdom, and accordingly the Outer Space Act 1986 does not apply to a person or organisation wishing to carry out spaceflight activities or operate a spaceport in the United Kingdom. The Outer Space Act 1986 **will** continue to regulate the following activities carried out overseas by UK entities: the procurement of the overseas launch of a space object, where the procurement takes place in the UK; the operation of a satellite in orbit from an overseas facility by a UK entity. Extant licences granted under the Outer Space Act 1986 for the carrying out of space activities from within the UK will continue to be governed under that regime. Where an application for a licence has been made under the Outer Space Act 1986, it will be assessed under that Act and – where successful – will result in the award of a licence under the Outer Space Act 1986.

What is the purpose of this document?

- 1.5 This guidance explains the process for completing an assessment of environmental effects (AEE) as part of a licence application under the Act. It explains what an AEE is, what the regulator requires the AEE to include (in line with its power under [section 11\(6\) of the Act](#)), the process for submitting an AEE and the way the regulator will consult on the submitted AEE.

Who is this guidance for?

- 1.6 This guidance is for any person or organisation that wishes to apply for either a spaceport or launch operator licence under the Act. An applicant for either licence will be required to complete an AEE.
- 1.7 It may also be of interest to:
 - applicants for other licences, to understand any information that either a spaceport or launch operator licence applicant may require from them

- any government department, public body or agency involved in the protection of the environment, including local planning authorities
- people or organisations whose local environment could be affected in some way by the granting of a licence – for example, residents of areas near a proposed spaceport

Using this guidance

- 1.8 The guidance is designed to help applicants understand what they will be required to do as part of completing an AEE. It may be of use before beginning a licence application as well as during the application process.
- 1.9 The guidance is not intended to cover every situation and applicants need to carefully consider how the Act (and any other relevant legislation) applies to their individual circumstances. However, the following guidance should help applicants to understand how to comply with the AEE obligation under the Act.
- 1.10 This guidance document should be read in conjunction with the guidance on [Applying for a Licence under the Space Industry Act 2018](#) and on the particular licence type.
- 1.11 If applicants have any queries, they are encouraged to contact the regulator, to seek clarification or gain further information.

The regulator

- 1.12 The Civil Aviation Authority (CAA) will perform the functions of the regulator under the Act. It is referred to in this guidance as ‘the regulator’. Under [section 2 of the Act](#), the regulator must carry out its functions relating to spaceflight activities with a view to securing the health and safety of members of the public and the safety of their property. This duty has primacy over the other matters that the regulator must take into account in exercising its functions.
- 1.13 In performing its functions, the regulator will need at times to review confidential and commercially sensitive information. The regulator already has robust security processes in place that will ensure all the information sent in relation to applications, and monitoring ongoing licensed activities, is handled and protected appropriately. For more details on the regulator’s security processes and systems, please contact the regulator.

Contacting the regulator

The regulator can be contacted by email to commercialspaceflight@caa.co.uk. The regulator welcomes and encourages ongoing contact from prospective applicants before they submit an application for a licence. This can be from the earliest stages of considering whether to apply for a licence.

Key terms

- 1.14 The Act regulates:
- space activities
 - sub-orbital activities and
 - associated activities

that are carried out in the UK.

- 1.15 As set out in [section 1 of the Act](#), “space activity” means

- (a) launching or procuring the launch or the return to earth of a space object or of an aircraft carrying a space object
- (b) operating a space object, or
- (c) any activity in outer space

1.16 “A space object” includes the component parts of a space object, its launch vehicle and the component parts of that.

1.17 “Sub-orbital activity” means launching, procuring the launch of, operating or procuring the return to earth of:

- (a) a rocket or other craft that is capable of operating above the stratosphere
- (b) a balloon that is capable of reaching the stratosphere carrying crew or passengers, or
- (c) an aircraft carrying such a craft

but does not include space activity. By way of clarification, the regulator will use the International Standard Atmosphere (47km) as the stratopause (i.e. the upper limit of the stratosphere) for the purposes of determining whether an activity is ‘sub-orbital’.

1.18 Space activities and sub-orbital activities are referred to in the Act as “spaceflight activities”.

1.19 “Spacecraft” means a space object, a rocket or other craft that is capable of operating above the stratosphere or a balloon that is capable of reaching the stratosphere carrying crew or passengers, that is used for spaceflight activities. It includes satellites.

1.20 “Launch” is defined in the Act as including causing a craft to take off (or releasing a balloon).

1.21 Regulation 2 of the Space Industry Regulations defines a launch vehicle, other than in references to a “US launch vehicle”, as:

- “(a) a craft to which section 1(5) of the Act applies and the component parts of that craft, or
- (b) a space object which is a vehicle and the component parts of that vehicle,

that is used for the purpose of the proposed spaceflight activities or the operator’s spaceflight activities, as applicable, but does not include a payload carried by the launch vehicle;”

1.22 The “craft to which section 1(5) of the Act applies” referred to in part (a) of this definition are:

- a rocket or other craft that is capable of operating above the stratosphere
- a balloon that is capable of reaching the stratosphere carrying crew or passengers

1.23 Part (b) of the definition covers vehicles that are capable of reaching orbit, such as those used to place a satellite payload in orbit. As explained below, the operator of any satellite carried on board a launch vehicle does not require their own launch operator licence, but does require an orbital operator licence.

1.24 Associated activities include the operation of spaceports and range control functions.

1.25 Under the Act, any site from which a spacecraft or carrier aircraft is intended to launch is considered a spaceport, and must be licensed. A site at which controlled and planned landings of spacecraft are to take place is also a spaceport and must be licensed.

1.26 Range control services are defined in [section 6](#) of the Act as:

- “(a) identifying an appropriate range for particular spaceflight activities;
(b) co-ordinating arrangements for the activation and operation of the range;
(c) obtaining all necessary information for identifying the range and for co-ordinating its activation and operation;
(d) ensuring that notifications are issued for the protection of persons who might be put at risk by spacecraft or carrier aircraft within the range or in the vicinity of it;
(e) monitoring the range, and the spacecraft or carrier aircraft for which it is provided, to ascertain
(i) whether the restrictions or exclusions to which the range is subject are complied with;
(ii) whether planned trajectories are adhered to;
(f) communicating any failure to comply with those restrictions or exclusions, or to adhere to those trajectories, for the purpose of enabling any appropriate actions to be taken in response;
(g) any prescribed services provided for the purposes of, or in connection with, services within any of paragraphs (a) to (f).”

- 1.27 Under [section 13\(1\) of the Act](#), the regulator has the power to include conditions in an operator licence (launch operator licence, return operator licence and orbital operator licence), spaceport licence and a range control licence. Licensees must comply with those conditions. [Schedule 1 of the Act](#) includes a list of examples of conditions, but this is not exhaustive, and the actual conditions included in a licence will vary depending on the operation planned and the type of licence issued. When deciding what conditions to include in a licence, the regulator must consult the public bodies, including the Health and Safety Executive, listed in [section 13\(6\) of the Act](#). Whenever the guidance refers to the regulator imposing conditions (other than a condition which the regulator is required to impose via the Regulations under section 13(3)), the obligation to consult these bodies applies.

Carrying out spaceflight activities at sea

- 1.28 If a person is proposing to launch or carry out other spaceflight activities from UK territorial waters or from a UK flagged ship elsewhere, the Act and Regulations will regulate the activities. Where appropriate, regulations which refer to land also apply to spaceflight activities from a ship – for example, where a regulation refers to a “place” or “other place” from which activities take place, in addition to activities from land. If a person is proposing to launch or carry out other spaceflight activities from a foreign flagged ship outside UK territorial waters and is a British national, UK body corporate or Scottish firm, the Outer Space Act 1986 regulates these activities.
- 1.29 Sea launch and other sea activities are a complex area; organisations wishing to conduct sea launches are advised to contact the regulator before applying for a licence. Further information on this can be found in section 2 of the guidance document [Applying for a licence under the Space Industry Act 2018](#).

Requirements and expectations

- 1.30 Where the guidance uses the term “must”, this refers to a requirement in or under the Act. If applicants / licensees fail to meet that requirement, it could result in the licence not being granted or being revoked or suspended. Where it is stated that “the regulator expects” applicants to do something, this describes a preferred approach; however, it is not a legal requirement to comply with the regulator’s expectations.

Types of licence

- 1.31 The Act refers to three types of licenses that can be awarded:
- operator licence
 - spaceport licence
 - range control licence

1.32 Following the publication of the Act, it was agreed that there should be different licensing requirements for different types of operators. For example, some organisations that would want to operate space objects (such as satellites or research vehicles) would not have a launch capability, and instead would wish to procure such capability and then operate the object once it reached orbit. While these organisations clearly do not need a licence to operate a launch vehicle, they are still required to obtain an operator licence to operate their object in space. Reflecting the various circumstances, there are now five licences available:

- **Launch operator licence:** means an operator licence within [section 3 of the Act](#) which authorises a person or organisation to carry out spaceflight activities that include launching a launch vehicle or launching a carrier aircraft and a launch vehicle. This is the type of licence needed if a person or organisation wants to launch a launch vehicle or use a carrier aircraft to assist with a launch of a launch vehicle. A person or organisation holding a launch operator licence is referred to as a spaceflight operator,¹ or in some circumstances, launch operator licensee. If a launch operator licensee wishes to return a launch vehicle launched from the UK or the UK's territorial waters to land in the UK, it can apply to do so under the launch operator licence and does not need to apply for a separate return operator licence.
- **Return operator licence:** means an operator licence within section 3 of the Act which is not a launch operator licence and which authorises a person or organisation to operate a launch vehicle, launched into orbit from elsewhere than the United Kingdom, in order to cause that vehicle to land in the United Kingdom. This is the type of licence needed if a person or organisation wants to return a launch vehicle, launched elsewhere than the United Kingdom, to land in the UK or within the UK's territorial waters. A person or organisation holding a return operator licence is referred to as a spaceflight operator,¹ or in some circumstances, return operator licensee.
- **Orbital operator licence:** means an operator licence which authorises a person or organisation to procure the launch of a space object into orbit, operate a space object in orbit or conduct other activity in outer space. 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. However, the licence may also cover any other activity in outer space, and is not limited to activities in Earth's orbit. For example, an orbital operator licence would be needed for missions in lunar orbit, lunar surface missions, or deep space probes. A person or organisation holding an orbital operator licence is referred to as an orbital operator licensee.
- **Spaceport licence:** means a licence granted under [section 3](#) of the Act authorising a person or organisation 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 place²). Spaceports can be licensed for vertical or horizontal launches (or potentially both). A horizontal spaceport must be located at an aerodrome that is already CAA licensed or certified and National

¹ The term spaceflight operator is used in the Regulations to refer to both the holder of a launch operator licence and the holder of a return operator licence. Any references to spaceflight operator in the Regulations or guidance encompass both licence types, so any requirements for spaceflight operators are applicable to both launch operator licensees and return operator licensees. Where a requirement only applies to either a launch operator licensee or return operator licensee, this is clearly stated.

² Ships used for sea launch or landing are not "sites" and are therefore not spaceports for the purposes of section 3 of the Act and so do not need a spaceport licence. However, certain types of installations at sea may be regarded as a "site" and so come within the definition. A person who wants to launch from, or land at, an installation at sea should contact the regulator to find out whether the installation they propose to use requires a spaceport licence.

Aviation Security Programme (NASP) directed. A person or organisation holding a spaceport licence is referred to as a spaceport licensee.

- **Range control licence:** means a licence granted under [section 7](#) of the Act authorising a person or organisation to carry out range control services in relation to spaceflight activities. That includes identifying an appropriate range; coordinating the use of a range; issuing protective notifications and monitoring the range. A person or organisation holding a range control licence is referred to as a range control licensee.

1.33 The AEE is only relevant to applicants for spaceport and launch operator licences.

Examples of offences and enforcement directions under the Act

- 1.34 Under [section 3 of the Act](#), it is an offence to carry out spaceflight activities or operate a spaceport in the UK without the required licence. It is also an offence to make a false statement for the purpose of obtaining an operator licence or a spaceport licence. A person who commits an offence under this section of the Act may be liable to a fine or imprisonment for a term not exceeding 2 years, or both.
- 1.35 Under [section 7 of the Act](#), it is an offence for range control services to be provided by anyone other than the Secretary of State, or a person or organisation authorised to provide them by a range control licence. It is also an offence for a person to make a false statement for the purpose of obtaining a range control licence. A person who commits an offence under this section of the Act may be liable to a fine or imprisonment for a term not exceeding 2 years, or both.
- 1.36 Under [section 13 of the Act](#), the regulator can grant a licence subject to conditions it thinks appropriate or must include a licence condition if required to do so by a regulation (see regulations 9(5) and 10(2)). When a condition is imposed, it is an offence for a licensee to fail to comply with that condition.
- 1.37 Under [section 17 of the Act](#), it is an offence for a spaceflight operator to allow any person to take part in spaceflight activities without them having given their informed consent and fulfilling the age and mental capacity criteria referred to in Part 12 of the Regulations. Under [section 18 of the Act](#), it is an offence for a licensee to allow any unqualified individual to take part in activities authorised by the licence or work in a specified role.
- 1.38 Under [section 27 of the Act](#), the regulator can also issue directions that enable effective enforcement action to be taken, where it appears to the regulator that a person is carrying out spaceflight activities or associated activities without a licence, in contravention of licence conditions or in contravention of the Act or rules made under it.
- 1.39 Under section 27(2), “the regulator may give any directions to that person that appear necessary to be in the interests of safety or for the purposes of securing compliance with—
- (a) the conditions of a licence,
 - (b) provisions contained in or made under this Act, or
 - (c) the international obligations of the United Kingdom.”
- 1.40 It is an offence for a person in receipt of a section 27 direction to fail to comply with it (see [section 31\(3\)\(a\) of the Act](#)). The regulator could also, if it wished to do so, enforce compliance by way of an injunction or equivalent (see section 31(4)).
- 1.41 There are further direction-making powers in the Act, including power for the Secretary of State to give directions under [section 28\(3\)-\(4\)](#) and [section 29\(1\)](#).

The full list of guidance documents issued in relation to the Act

1.42 The following guidance documents are available in relation to licences that can be granted under the Act (and any statutory instruments made under the Act):

- Applying for a licence under the Space Industry Act 2018
- Guidance for launch operator and return operator licence applicants and licensees
- Guidance for spaceport licence applicants and licensees
- Guidance for range control licence applicants and licensees
- Guidance for orbital operator licence applicants and licensees
- Guidance for the assessment of environmental effects
- Guidance on security matters for applicants and licensees
- Guidance on the investigation of spaceflight accidents
- Guidance on appealing decisions made under the Space Industry Act 2018 and the Outer Space Act 1986
- Guidance on insurance requirements and liabilities under the Space Industry Act 2018
- Guidance on duties for all licensees under the Space Industry Act 2018 including monitoring and enforcement by the regulator

1.43 In addition, applicants and licensees must follow the Regulator's Licensing Rules and are advised to read the Principles and guidelines for the spaceflight regulator in assessing ALARP and acceptable risk.

Section 2: Legislative Background

The Space Industry Act 2018

- 2.1 As set out above, the Act regulates all spaceflight activities and associated activities carried out in the United Kingdom. “Spaceflight activities” are space activities and sub-orbital activities.
- 2.2 It requires any person or organisation wishing to undertake spaceflight activities or associated activities to obtain the relevant licence.
- 2.3 It supersedes the Outer Space Act 1986 for all activities carried out in the UK.

Section 11 of the Space Industry Act 2018

- 2.4 [Section 11](#) of the Act stipulates that all applicants for either a spaceport or launch operator licence are required to submit an assessment of environmental effects (AEE) as part of their licence application.
- 2.5 The regulator is required to take the AEE into account when deciding whether to grant a licence and what, if any, conditions should be attached to such a licence.
- 2.6 The regulator cannot grant a spaceport licence or launch operator licence until an AEE has been submitted.
- 2.7 Under [section 11\(4\)](#) of the Act, the regulator can, at its discretion, permit applicants to submit an equivalent assessment, prepared previously, as part of the AEE. This is intended to avoid any unnecessary duplication of effort. This document includes further details on the types of assessment that can be used, and the criteria for using them.
- 2.8 There are no regulations for the AEE, however, under [section 11\(6\)](#) of the Act, the regulator is required to issue guidance about:
 - (a) the form, contents and level of detail of an assessment of environmental effects
 - (b) the time for submitting an assessment of environmental effects
 - (c) the circumstances in which the regulator will or may give a direction under section 11(4).

This guidance fulfils that requirement.

Commencement of the Act

- 2.9 The Space Industry Act 2018 received Royal Assent on 15 March 2020, providing a legislative framework for the licensing of space activities, sub-orbital activities, and associated activities carried out in the UK. However, many of the Act’s provisions will only come into force on 29 July 2021, when the Space Industry Regulations come into force. From that date, people and organisations will be able to apply for a licence to:
 - launch a launch vehicle from the UK for sub-orbital missions involving human occupants, or return such a launch vehicle to the UK
 - launch a launch vehicle from the UK for orbital missions that do not involve human occupants, or return such a launch vehicle to the UK
 - procure the launch from the UK of a space object (such as a satellite) into orbit
 - operate a satellite from the UK
 - operate a spaceport in the UK, or

- provide range control services in the UK

2.10 However, at the point the Regulations come into force, it will not be possible to apply for a licence for some activities that are permitted under the Act. These include:

- the licensing of space activities involving an orbital launch vehicle with human occupants
- the licensing of spaceflight activities involving hypersonic (or any other experimental) transport from A to B

2.11 Such activities are technically complex and difficult to regulate. By their very nature, they will require global collaboration on common standards to a much higher threshold than is achievable with current technologies.

2.12 These restrictions are set out in Commencement Regulations, which also include provisions to ensure that the licensing of a procurement of an overseas launch carried out under the Outer Space Act can continue to be done under that Act, whether such a procurement takes place in the UK or overseas.

Section 3: Introduction to the assessment of environmental effects

The purpose of the AEE

- 3.1 The purpose of the AEE is to ensure that applicants for either a spaceport or launch operator licence have considered the potential environmental effects of their intended activities and, if necessary, taken (or identified) proportionate steps to avoid, mitigate or offset the risks and their potential effects. The regulator cannot grant either licence without seeing an AEE. It may also use information provided as part of the AEE to determine relevant conditions to attach to the licence.
- 3.2 There are established frameworks for conducting environmental impact assessments, which may be used when conducting and presenting an AEE. However, the AEE may be required to go beyond the scope of these existing environmental assessment frameworks, to reflect the nature of spaceflight activities.

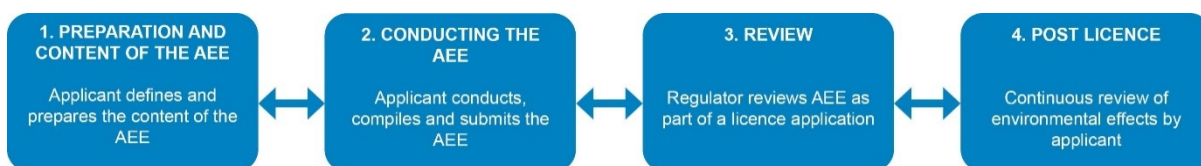
Examples of good practice methods include:

- the Environmental Impact Assessment framework, required by the [Town and Country Planning \(Environmental Impact Assessment\) Regulations 2017](#) and the [Marine Works \(Environmental Impact Assessment\) Regulations 2017](#), including relevant guidance documents;
- the Chartered Institute of Ecology and Environmental Management (CIEEM) [Ecological Impact Assessment Guidelines](#) (EcIA) 2018

Main stages of the AEE process

- 3.3 The AEE is a process of identifying, quantifying and evaluating the potential effects of the proposed activities on the environment.
- 3.4 The process to undertake an AEE can be subdivided into four broad stages as shown in figure 1. Although not included in figure 1, the regulator encourages pre-application engagement to discuss the proposed activities.

Figure 1: Overview of AEE process



Stage 1: Preparation and content of the AEE

- 3.5 The applicant prepares for the AEE by determining the content and extent of issues to be considered and reported in the AEE. At this stage, information should be collected on the environmental baseline in the absence of the proposed activities, to inform the assessment of effects.
- 3.6 The preparation and content of the AEE is discussed further in [section 4](#) of this guidance.

Stage 2: Conducting the AEE

- 3.7 During this stage, the applicant conducts, compiles and submits the AEE.
- 3.8 The AEE must include the information reasonably required to assess and reach a decision on the likely significant effects, from the proposed activities, on the environment.

3.9 Conducting the AEE is discussed further in [section 5](#) of this guidance.

Stage 3: Regulator reviews the AEE

3.10 The AEE, and any consultation comments received, will be taken into account by the regulator in deciding whether or not to grant a licence and what licence conditions should be attached to ensure the protection of the environment.

3.11 How the regulator reviews the AEE is discussed further in [section 6](#) of this guidance.

Stage 4: Post licence requirements

3.12 Licence conditions may be set by the regulator requiring the environmental effects to be considered continually during the lifetime of the licence. Spaceport and launch operator licensees will be responsible for complying with any licence conditions and monitoring requirements that have been set.

3.13 Post licence requirements are discussed further in [section 7](#) of this guidance.

Section 4: Preparation and contents of the AEE

What should be considered when preparing an AEE?

- 4.1 The AEE must identify, describe and assess the potential direct and indirect significant effects of the proposed spaceflight activities on the following environmental features, including interaction among those features:
- population and human health
 - biodiversity (for example, ecology, flora and fauna)
 - air quality
 - noise and vibration
 - water (for example, quantity and quality)
 - marine environment
 - climate (for example, greenhouse gas emissions, impacts relevant to adaptation)
 - land, soils and peat
 - landscape and visual impact
 - material assets and cultural heritage (including architectural and archaeological aspects)
- 4.2 The potential effects must include those that could arise from accidents/disasters that could occur during, or as a result of, the proposed activities. Further explanation on what will be required is provided in paragraphs 4.64 to 4.68.
- 4.3 It must describe how specific potential effects have been identified and, where possible, quantified. When considering the significance of effects, it must cover the direct effects and any indirect, secondary, cumulative, transboundary, short term, medium term, long term, permanent and temporary, positive and negative effects of the proposed spaceflight activities.
- 4.4 The AEE must provide a full description of the proposed activities: however, the focus must be on the significant environmental effects that could arise from the proposals. The AEE should be proportionate and succinct. Effects which have little or no significance will only require brief analysis to demonstrate that they have been considered.
- 4.5 It must also explain, where appropriate, what other environmental assessments have been conducted in relation to the proposed activities (e.g. an environmental impact assessment required as part of a planning application) and whether these are being used in support of the AEE.

Spaceport AEE

- 4.6 A spaceport AEE is described in [section 11\(3\)\(a\) of the Act](#):

In this section “assessment of environmental effects” –

(a) in relation to a spaceport licence, means an assessment of the effects that launch(es) of spacecraft or carrier aircraft from the spaceport in question, or launches of spacecraft from carrier aircraft launched from the spaceport, are expected to have on the environment

- 4.7 The spaceport AEE must cover all operations and activities intended to be carried out at the spaceport that may have an environmental effect from the spaceflight activities.
- 4.8 The applicant must use the latest and most relevant data about the prospective launch vehicles and activities to model the environmental effects of likely launch(es) from that location.

- 4.9 It is possible to apply for a spaceport licence without knowing the full details of launch vehicles. In this case, applicants must base their AEE on a reasonable worst-case scenario, based on the representative launch vehicle(s) they are aiming to attract. Should the anticipated launch vehicles change before the licence is granted, a revised AEE may be required.
- 4.10 Applicants for a spaceport licence are required to set an environmental budget. The budget is the maximum number of launches per launch vehicle type that can take place over the course of a year that can be carried out in an environmentally sustainable manner. The budget must take into account the cumulative effects of all launches.
- 4.11 The regulator will then review the proposed budget as part of its overall assessment of the licence application. It can then decide that, to reduce the environmental effects, the number of launches from the spaceport should be reduced. This would then be set out in a condition on the licence.
- 4.12 Under the Act, the AEE conducted for a spaceport licence is only required to cover the operational phase of the proposed operations. The construction and decommissioning phases are not required to be covered by the AEE under the Act. The environmental effects of these activities will be assessed during the planning permission stage, where planning permission is required.

Launch operator AEE

- 4.13 A launch operator AEE is described in [section 11\(3\)\(b\) of the Act](#) as:

In this section “assessment of environmental effects” –

(b) in relation to an operator licence authorising launches of spacecraft or carrier aircraft, means an assessment of the effects that those launches are expected to have on the environment.

- 4.14 The launch operator AEE must cover all operations and activities that could have an environmental effect from the proposed launch(es).
- 4.15 The applicant must provide a detailed assessment of the environmental effects of the specific launch(es) they are intending to apply for. The regulator will expect more detailed data for a launch operator AEE than for a spaceport AEE as the launch vehicle(s) will be known. The AEE must be based on the actual details of the class, type and detailed requirements of the launch vehicle and must not be based on assumptions.
- 4.16 If more than one launch is being applied for, under the same launch operator licence application, then a cumulative assessment of those launches must be conducted. The launch operator AEE must also include any test launch(es) that will be authorised by the launch operator licence.
- 4.17 The AEE must cover the entire launch operation, including:
- from ground processing to the injection of the payload on orbit
 - reusable or/and refurbishable elements, for example, the return flight of a reusable spaceplane
 - objects jettisoned during the course of a nominal launch operation, for example, spent stages and fairings
 - for a sub-orbital operation, until the vehicle returns to earth
- 4.18 The AEE does not need to consider the re-entry of upper stages from orbit at the end of their useful mission.

Form and submission of the AEE

- 4.19 It is the applicant's responsibility to prepare and submit the AEE. To ensure the completeness and quality of the AEE, it must be prepared by competent experts. A statement must be provided outlining the relevant expertise, or qualifications of such experts, sufficient to demonstrate that this is the case.
- 4.20 The AEE must be clear, concise and use plain, non-technical language where possible, providing a glossary where industry terms are used.
- 4.21 There is no statutory provision as to the form of an AEE but the regulator will expect it to constitute a single and accessible compilation. The AEE must include the information that is reasonably required for reaching a reasoned conclusion on the significant effects of the proposed activities on the environment, taking into account current knowledge and methods of assessment. Annex A of this guidance contains a recommended format and structure for an AEE.
- 4.22 Prospective applicants are encouraged to consider the environmental effects of their proposed operations from the very outset, taking into account the most up-to-date scientific research within the field, as well as existing government policy.
- 4.23 The following factors may have an impact on the timeliness of the AEE process:
- decisions as to whether information is sensitive due to commercial confidentiality and/or national security
 - where consultation periods are required to be extended
 - where further information is required to complete the AEE

Scoping

- 4.24 Although there is no statutory requirement for applicants to undertake scoping, the regulator expects applicants to follow good practice by carrying out a scoping exercise. This will help to identify the main issues to be addressed within the AEE and scope out issues unlikely to have a significant effect early on.
- 4.25 Detailed scoping of an AEE will form the foundation of a focused and proportionate assessment. Effective scoping will help to:
- identify the content and extent of the key issues quickly and effectively
 - avoid delay later in the application process
 - improve the planning of the AEE
 - facilitate wide-ranging consultation, where appropriate
 - identify overlaps between the AEE and any other environmental assessments required under other statutory arrangements and therefore how these may contribute to the AEE
 - give an early indication of where alternative proposals or mitigation measures may be necessary

Consultation with environmental authorities, other interested parties and the public

- 4.26 The regulator may consult on the AEE with environmental authorities and public bodies in the jurisdiction of the proposed operations. The regulator must inform all consultees how and by when they need to make representations.

4.27 The Aarhus Convention³ establishes a number of rights for the public concerned (members of the public affected by, or with an interest in, the environmental decision-making in question, which can include non-governmental organisations) with regard to decisions about the environment. In line with the convention's provisions, the regulator will consult with the public. Consultation will enable the public to access the submitted AEE and to express their opinions on the proposals. The regulator will publish a notice of the submitted AEE and instructions for how people can comment on it and see the AEE on their website. Members of the public and anyone interested in the submitted AEE will be given a specified period of time within which to comment.

Commercially sensitive information

As part of the consultation process, members of the public will be given access to information contained within the AEE and associated documents. If there is any information included in these documents that the applicant believes is commercially sensitive, or that could compromise national security if revealed, the applicant can ask the regulator to remove this information from the published documents.

When submitting the AEE, the applicant must set out in writing what information they view as commercially sensitive and why. The regulator will review the applicant's request and reply in writing.

Publishing in the public domain

4.28 Once a licence is granted, information relating to the AEE (subject to the above regarding commercially sensitive information) will be available, on request to the regulator, through public registers and under the [Freedom of Information Act](#) (FoIA) and the [Environmental Information Regulations](#) (EIR).

Relationship of AEE with other environmental assessments

4.29 The AEE is required as part of the licence application process under the Act. It is in addition to any other environmental impact assessments that may be required under different laws in relation to the proposed activities. It is the applicant's responsibility to identify the need for other assessments and consents, such as planning permission, environmental permits and marine licences. These consents may need to be sought prior to launch, independently to the submission of the AEE.

4.30 Where other consents are required, it is recommended that the applicant makes the applications in parallel wherever feasible. This should speed up the process and allow for potential issues to be identified and resolved early on.

4.31 [Section 11\(4\) of the Act](#) enables the requirement to provide an AEE to be met, or met in part, by an equivalent assessment previously prepared in compliance with another statutory requirement or one prepared in respect of an earlier application where there has been no material change. For example, if a noise assessment was completed as part of the planning process, the regulator may direct that this satisfies the noise requirements of an AEE. This power is designed to avoid duplication of effort.

Varying a licence

4.32 The regulator intends (subject to the consultation required by section 13(6) of the Act) to impose a licence condition requiring that whenever a licensee applies to vary an existing spaceport licence or launch operator licence, they must submit a new or revised AEE.

³ See <https://unece.org/environment-policy/public-participation/aarhus-convention/text>

- 4.33 If the licensee believes that the proposed variation would make no material change to the AEE, then they should resubmit the previous AEE along with justification as to why this remains sufficient.

Appeals

- 4.34 If the regulator refuses to grant or vary a licence on the basis of the AEE, or imposes conditions the applicant disagrees with, the applicant is entitled to appeal. The process for appeals is set out in the separate [Guidance on Appealing Decisions Made Under the Space Industry Act 2018](#).

What must be included in an AEE?

- 4.35 During the preparation of the AEE, applicants will determine the content of the AEE including:
- what issues the AEE will address
 - the methods that the applicant intends to use
 - the spatial and temporal limits for surveys and assessments
 - the environmental baseline (i.e. the conditions that exist before the proposed activities take place)
- 4.36 At the preparation stage, it can be difficult to establish the full extent of likely effects. When deciding what areas to cover in the AEE, the applicant must follow a precautionary approach, to ensure the AEE considers all areas where significant effects could occur.
- 4.37 To assist with this, the regulator recommends that the applicant seeks advice from relevant environmental authorities and public bodies, to help ensure that all effects, issues, concerns and mitigation which interested parties believe should be considered in the AEE are addressed.
- 4.38 Applicants must identify and then conduct the assessment on the following:
- activities to be considered
 - overall launch allowance and launch frequency (launch baseline)
 - environmental topics in scope
 - environmental zones of influence
 - alternative proposals
 - accidents and disasters
 - avoidance and mitigation measures
 - cumulative effects
 - environmental baseline
- 4.39 The AEE must be based on the latest available information about the proposed activities:
- A spaceport AEE must be based on details of the specific launches that the spaceport intends to facilitate. If these are not yet known, it must be based on representative launch vehicles and a reasonable worst-case scenario.
 - A launch operator AEE must be based on the details of the specific launch(es) that is being applied for in the prospective licence.

Proposed activities

- 4.40 The AEE must provide a description of the activities considered as part of the assessment, including the following:
- launch vehicle specification (including mass at lift-off, propellant and consumable mass, hazardous materials on launch vehicle and/or payload and components jettisoned during flight)
 - launch operations (including the processing and integration of the vehicle and payload and the launch itself)

- mission profile (launch to end-of-mission, including the timing and location of jettisoned components)
 - the location and extent of the activities
 - the identified environmental zone(s) of influence of the activities, including activities off site that may be relevant, such as jettison of objects
- 4.41 The AEE must cover all proposed activities that may cause an environmental effect, including both the launch activity and associated activities directly related to launch.
- 4.42 The activities identified must include any day-to-day operations that are intrinsically linked to the launch activities, which could have an environmental effect. Examples of linked activities include, but are not limited to:
- propellant and hazardous materials storage and handling
 - assembly of launch vehicle
 - launch vehicle and payload processing
 - propellant loading of launch vehicle and payload
 - static fire testing
 - jettison of objects
 - disposal, recovery and refurbishing of launch vehicle
- 4.43 The contributions from jettisoned or separated items during the flight must include information on the status of the components jettisoned at release and at the point of impact with the earth's surface. A description of this information will need to be presented in the AEE.
- 4.44 The AEE must provide information about:
- where, when, how and for what period of time the proposed activities will take place
 - what changes in the environment are likely to occur as a result of the identified activities (including short-term changes as well as any longer-term changes)
 - the extent and magnitude of the effects
 - the environmental zones of influence of the activities, including off-site activities that might be relevant, such as spectators and the depositing of jettisoned objects and
 - possible pathways from the sources of the effects to the receptor or environment, such as noise, water, air
- 4.45 The activities of carrier aircraft will only need to be assessed when used in direct connection with a launch. Therefore, an AEE does not need to cover carrier aircraft operations where a launch is not intended. For example, where an aircraft flies to a spaceport to facilitate a later launch from the spaceport, this 'ferry flight' does not need to be assessed in the AEE.

Overall launch allowance and frequency

- 4.46 The applicant must define an overall launch allowance and launch frequency to allow a launch baseline to be established. The overall launch allowance is the maximum number of launches that the applicant intends to carry out. The launch frequency refers to the number of launches the applicant intends to take place over a specified period of time, for example per month or per week. The AEE must be conducted on this launch baseline.

- 4.47 In addition to the number of launches, the AEE must also consider the type of launches the applicant proposes to conduct (or, for a spaceport applicant, to facilitate). This is essential context for the AEE and assessing the cumulative effects of launches.
- 4.48 Where certain periods of time are identified as being environmentally sensitive, for example known breeding, wintering and/or migratory months, the proposed launch frequency must take this into account.
- 4.49 The applicant must take into consideration the environmental effects of test or scrubbed launches in setting the launch allowance and launch frequency.
- 4.50 In a launch operator AEE the applicant must indicate how much of the spaceport's launch allowance (environmental budget) they are intending to use. This will ensure that the spaceport can facilitate their launch requirements without exceeding the environmental budget.

Environmental topics in scope

- 4.51 The AEE must address the following environmental topics that are likely to be affected by the proposed activities:
- population and human health
 - biodiversity (for example, ecology, flora and fauna)
 - air quality
 - noise and vibration
 - water (for example, quality and quantity)
 - marine environment
 - climate (for example, greenhouse gas emissions, impacts relevant to adaptation)
 - land, soils and peat
 - landscape and visual impact
 - material assets and cultural heritage (including architectural and archaeological aspects)
- 4.52 How these environmental topics may be affected must be described in the AEE. The applicant must also consider what specific characteristics of the surrounding environment could be affected by the proposed activities and their inter-relationships. Furthermore, the receptors which could be affected by the activities must be identified, for example sensitive habitats and species.
- 4.53 Where the applicant deems that any of the environmental topics will not be significantly affected, they must clearly explain why in the AEE.

Environmental zones of influence

- 4.54 As part of the AEE the applicant must identify and describe the geographical areas where potential effects could take place. These are known as the environmental zones of influence.
- 4.55 When establishing the environmental zones of influence, the seasonal prevailing meteorological conditions and favourable launch weather conditions must be taken into account.
- 4.56 For spaceport AEEs, the environmental zones of influence will extend beyond the spaceport boundary to include all areas in which the environmental features could be affected by the proposed spaceport and launch activities it is intending to facilitate. As a minimum, a spaceport AEE must assess environmental effects in the following areas:

- in the vicinity of the spaceport – an appropriate radius around the spaceport
- drop zone(s) – the area(s) at which jettisoned objects are expected to be deposited into the sea. This will help identify early on where the drop zones are likely to be, any sensitive areas, and how many jettisoned objects can be deposited before there are significant effects
- proposed trajectories – on the basis of the different types of launches the spaceport intends to facilitate. For example, the effects along the likely launch trajectory that the applicant should consider include air, greenhouse gases, noise and vibration emissions.

4.57 For a launch operator AEE, the environmental zones of influence are the areas whose environmental features could be affected by the specific launch(es) to be carried out under the prospective licence. The environmental effects must be considered for the entire launch and, as a minimum, the applicant must identify the following areas:

- in the vicinity – this radius should be the same as the one used for the spaceport AEE where the launch(es) will take place from. Justification must be made where an alternative radius is proposed
- along the trajectory – areas along the launch/return trajectory. For horizontal launch, the trajectory environmental zone of influence must take into consideration the take-off and landing, the initial and final descent of any space object or carrier aircraft and where relevant its flight to the point of mid-air launch
- drop zone(s) – the area(s) where any jettisoned objects will be deposited into the sea.

4.58 The AEE must also provide an assessment of whether there could be any global impacts from the proposed activities, for example climate change from greenhouse gases.

4.59 As well as any primary effects identified, the AEE must consider whether there may be any secondary or indirect environmental effects from the proposed activities. For example, jettisoned objects in the ocean could affect the water quality and ecology of the water environment in the short term. A secondary effect could be the impact of this on fishing and other uses of the water.

4.60 It is possible that proposed activities could affect environmental features in several areas of sovereignty and across national boundaries. The AEE must cover the environmental zone of influence, regardless of administrative boundaries, to take into account transboundary effects.

4.61 If the applicant has insufficient information available to properly define the environmental zone of influence, this must be acknowledged in the AEE, and a precautionary approach must be taken.

Alternative proposals

4.62 Where significant effects are likely, the applicant must consider reasonable alternatives to mitigate those effects as part of the AEE.

4.63 To assess the effects of any alternatives considered, information will be needed on each alternative, for example:

- location
- designs and technology i.e. materials, sizes, propellants, payload
- timing and frequency
- means of meeting the objectives of the operations

The regulator will expect to see comparisons between any alternative options considered. In selecting a specific option(s), applicants must justify this option within the AEE.

Accidents and disasters

4.64 The wider assessments carried out in support of both launch operator and spaceport licence applications, particularly with regards to safety, will contain information pertinent to the AEE. The regulator expects applicants to refer to the relevant guidance documents to ensure that efforts are not duplicated in satisfying the requirements in these areas.

- 4.65 The AEE must include a description of the environmental effects of reasonable worst-case scenarios⁴ from accidents and disasters which could occur during, or as a result of, the proposed activities. These must include as a minimum:
- possible off-nominal launch scenarios, accounting for where these occur (for example, on the launch pad, or in flight)
 - fuel and hazardous material storage and handling (for example, failure of containment)
- 4.66 The AEE must identify the hazards from the proposed activities and how the vulnerability to the accidents and disasters can be avoided or reduced to prevent significant environmental effects.
- 4.67 When considering the possibility of reasonable worst-case scenarios and the effects they can have on the environment, the AEE must take particular account of high consequence events and:
- the likelihood of the accident or disaster occurring, considering the measures already embedded into design (for example, flight safety system)
 - the likelihood that an environmental topic or receptor would be affected by the reasonable worst-case scenarios
- 4.68 The AEE must provide information on:
- the scenarios assessed and the extent of their influence
 - what changes in the environment are likely to occur as a result of the identified scenarios
 - what changes in the environment are likely to occur as a result of any proposed emergency response plans
 - the extent and magnitude of the effects
 - possible pathways from the sources of the effects to the receptor or environment, such as contaminated water run-off to surface water or atmospheric dispersion of pollutants to air

Cumulative effects

- 4.69 Both a spaceport and launch operator AEE must provide a description of the likely cumulative effects of the proposed activities on the environment. Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time and/or in a concentrated location.
- 4.70 In the AEE, the applicant must take into account, as a minimum, the following potential cumulative effects within the environmental zones of influence:
- impact interactions – the reactions between different impacts of the proposed operations or with other projects in the environmental zones of influence
 - additive effects – effects that result from incremental changes caused by other past, present or reasonably foreseeable actions, when considered together with the proposed operations
- 4.71 Applicants must identify and describe the cumulative effects that could arise from the proposed operations as a whole. This must take into account:
- inter-project effects – where an environmental topic/receptor is affected by impacts from more than one project at the same time and the impacts act together

⁴ The regulator follows the definition of reasonable worst-case scenarios set out in the National Risk Register of Civil Emergencies, which is “a challenging manifestation of the scenario, after highly implausible scenarios are excluded.” For more details, see: <https://www.gov.uk/government/publications/national-risk-register-for-civil-emergencies-2015-edition/national-risk-register-of-civil-emergencies-chapter-1-main-types-of-civil-emergency>

- intra-project effects – where an environmental topic/receptor is affected by more than one impact from the same proposed operations and the impacts act together

4.72 Other projects include other spaceflight activities and non-spaceflight activities.

Avoidance and mitigation measures

4.73 Both a spaceport and a launch operator AEE must include a description of the measures that could be put in place to avoid, reduce, and, if possible, remedy any significant environmental effects of the proposed activities. This description must also explain the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset.

4.74 Applicants must follow established best practice when considering mitigation measures. As shown in figure 2, a sequential process should be adopted when identifying measures to avoid, mitigate and compensate for negative environmental effects, referred to as the ‘mitigation hierarchy’.

4.75 Applicants must also identify any potential residual effects, for example, loss of, or permanent damage to environmental features despite mitigation measures.

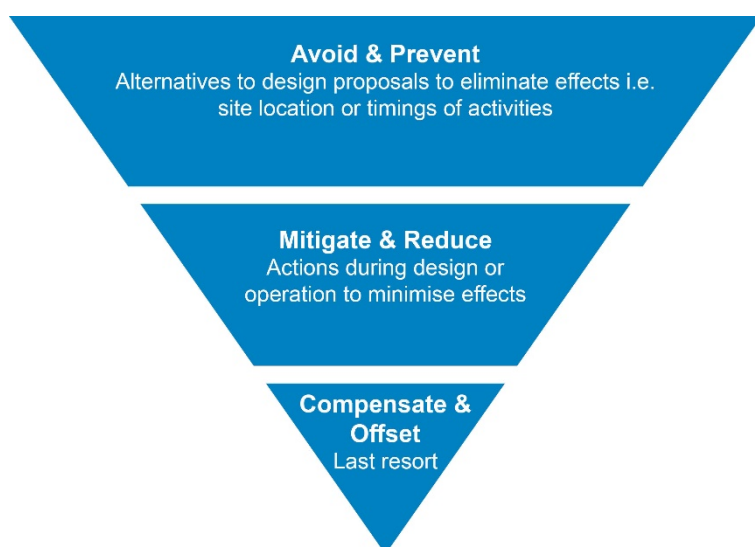


Figure 2: Mitigation hierarchy

Establishing the environmental baseline

4.76 The environmental baseline conditions are those that exist prior to the proposed activities. The AEE must demonstrate how the conditions may change in relation to this baseline as a result of the proposed licensed activities. The AEE must be conducted against this established baseline.

4.77 In the AEE the applicant must provide a description of the relevant aspects of the current state of the environment (baseline scenario) and how it may change in absence of the proposed activities. Consideration must be made in the AEE if it is likely that the baseline conditions reported in the AEE may change by the time the proposed activities take place.

Section 5: Conducting the AEE

- 5.1 The applicant must engage a competent expert(s) to conduct the AEE.
- 5.2 The assessment must include potential effects on the environmental topics listed in paragraph 4.51 above. These effects must be assessed against the environmental baseline in terms of:
- their magnitude and/or extent
 - the nature of the effect (direct, indirect, primary, secondary, residual or cumulative)
 - their duration, frequency and remediation
- 5.3 It must include a description of how the baseline conditions will change as a result of the proposed activities.
- 5.4 Based on this, the AEE must reach a view of the significance of the activities' environmental effects against the relevant environmental topics *without* mitigation and *with* mitigation.
- 5.5 The AEE must also consider any significant environmental effects arising from accidents and disasters which could result from the proposed activities, as well as measures to prevent or mitigate these. The regulator expects these to be considered in conjunction with safety when preparing applications for spaceport or launch operator licences, particularly in the context of the emergency response plan and potential remediation requirements.
- 5.6 The AEE must also demonstrate how the proposed activities will comply with statutory requirements and environmental policy objectives. This must take into consideration international, national and local legislation and objectives, for example for air quality standards and protection of local, national and international designated habitat sites.
- 5.7 The regulator expects the emphasis of the AEE to be on the environmental topics which have been identified as having potentially significant environmental effects as a result of the proposed activities. Effects which have little or no significance will need to be described only very briefly in the AEE (along with an explanation of how that view on significance has been reached).
- 5.8 A spaceport or launch operator licence cannot be granted until the assessment of environmental effects has been submitted, reviewed and approved. The regulator is entitled to ask for any further information if deemed necessary.

Assessing significance

- 5.9 Applicants are required to assess whether the proposed activities are likely to have any significant effects on the environment. They must then include proposed mitigation for any significant effects.
- 5.10 A conclusion must be reached on the significance of the effects for each of the environmental topics and, where mitigation is in place, any residual effects.
- 5.11 Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of biodiversity, a significant effect is an effect that either supports or undermines biodiversity conservation objectives for important ecological features or for biodiversity in general. In terms of other environmental topics, a significant effect is simply an effect that is sufficiently important to

require assessment and reporting, so that the regulator is adequately informed of the environmental consequences of licensing a proposal.

- 5.12 The evaluation of significant effects must always be based on the best available scientific evidence. If there is any doubt about whether an effect is significant, a precautionary approach must be taken, where applicants assume it is a significant effect and treat it accordingly.
- 5.13 For all significant effects, the applicant must include an assessment of significance of the effect *without* and *with* mitigation. This serves to demonstrate the effectiveness of the proposed mitigation and enables the regulator to consider whether the proposed control measures are sufficient.
- 5.14 The significant effects must be assessed in the context of the established environmental baseline conditions within the environmental zone(s) of influence.

Assessing cumulative effects

- 5.15 The applicant must assess the inter-project and intra-project effects of the proposed activities.
- 5.16 For each environmental topic, applicants are required to reach a conclusion about whether the proposed activities, under the prospective licence, are likely to have a cumulative significant effect. Where a likely significant effect is found, applicants must propose measures to avoid and mitigate this effect, noting any residual effects.

Assessing mitigation measures

- 5.17 The AEE must include a description of the mitigation measures, their expected effectiveness and provide an assessment of any residual effects.
- 5.18 Any control measures the applicant proposes in the AEE must be designed to avoid, reduce or compensate for any significant adverse environmental effects of the proposed activities. Compensation refers to measures taken to offset residual effects and should be seen as a last resort when all other mitigation measures have been exhausted.
- 5.19 Consideration must be made to where there could be enhancement in order to produce a net gain for biodiversity and the environment.
- 5.20 Applicants are required to:
- identify a range of control measures, in line with the mitigation hierarchy
 - explain the likely effectiveness of each measure
 - assess and provide a description of the significance of any residual effect
 - state as a result of the analysis, which measure(s) they intend to use
 - identify where monitoring is required to ensure the success/effectiveness of the measures
 - provide sufficient information to demonstrate how the chosen measure(s) can be effectively implemented

Using equivalent assessments within the AEE

- 5.21 Under [section 11\(4\) of the Act](#), the regulator may permit an applicant to submit an assessment prepared under another enactment (or previous Space Industry Act licence application) to satisfy the requirement for an AEE either in part or in full. This can be done where the assessment is equivalent to that required as part of the AEE and where there has been no material change in circumstances since the previous assessment was prepared.

- 5.22 For example, a spaceport licence applicant may have conducted an environmental impact assessment (EIA) in support of a planning application or an environmental assessment for a marine licence or environmental permit application. If the regulator considers it appropriate, environmental assessments conducted in support of applications for these consents can be used for the AEE.
- 5.23 Aspects of an AEE submitted for a spaceport licence could potentially be used in an AEE for a launch operator licence, and vice versa. This would require the consent of the other applicant/licensee. The regulator expects prospective launch operator licensees to explore this with the spaceport licensee.
- 5.24 Previously submitted AEEs may still be adequate for the proposed operations, for example, where a launch operator wants to replicate the last licensed launch, providing there has been no material change in circumstances since its submission. The original baseline and any cumulative effects would, however, still need to be updated in this instance.
- 5.25 It is the applicant's responsibility to check whether any such assessments are sufficient. Some may only meet part of the criteria for an AEE. For example, an EIA might not consider the effects of launch failure, so the applicant would also need to submit an assessment of the environmental effects of launch failure.

Section 6: How the regulator reviews the AEE

- 6.1 The regulator will review the AEE to satisfy itself that the applicant's assessment is sufficiently robust and provides adequate protection of the environment. It will assess the AEE information and reach a reasoned conclusion on whether it agrees with the significance findings in the AEE, for each environmental topic *without* and *with* mitigation and the overall cumulative effects.
- 6.2 It will also consider whether the control measures proposed are appropriate for mitigating the risks and their potential effects.
- 6.3 The regulator can then:
- determine that the environmental effects as set out in the AEE are acceptable and continue with its assessment of the licence application. (However, the decision to grant a licence will depend on the applicant meeting all the other criteria, as set out in the Act and its Regulations.)
 - request that the applicant revisits some areas of the AEE and then resubmits it, with further evidence as necessary
 - determine whether to impose licence conditions. These will only come into effect if the applicant meets all other criteria required for a licence
- 6.4 After reviewing the AEE, as part of the licence application, the regulator may request the applicant in writing to:
- make available for inspection by the regulator any site, facility, equipment, craft such as the launch vehicle and carrier aircraft to be used in connection with the activities which are subject of the AEE and licence application as the regulator may specify
 - produce for inspection any document or record in possession or control of the applicant as the regulator may specify
 - make available for interview any officer or employee of the applicant or any other person acting on the applicant's behalf
- 6.5 For more details of the regulator's powers when assessing applications, see the separate guidance document [Applying for a Licence under the Space Industry Act 2018](#).

Consultation and public participation

- 6.6 As part of its review, the regulator will take into account comments received from the public or other organisations through the consultation process.
- 6.7 Consultation will endeavour to ensure licence conditions that the regulator may set are consistent and do not contradict any other environmental permissions set by other competent authorities.

Licence conditions

- 6.8 When granting a licence, the regulator has a duty to take the AEE into account when deciding what licence conditions to impose ([section 11\(5\)\(b\)](#)).
- 6.9 Conditions could include:
- conditions stipulating objectives or outcomes
 - conditions requesting further evidence in support of assumptions within the AEE
 - standards to mitigate a particular environmental effect or risk, and

- conditions addressing monitoring requirements for environmental effects
- 6.10 Any licence conditions should clearly state the objective, standard or desired outcome of the condition, so that the licensee understands what is required.
- 6.11 The regulator should take into consideration any conditions or obligations that the applicant already has to fulfil under other regulatory regimes, with a view to avoiding duplication.

Habitats Regulations Assessment

- 6.12 Where there could be a likely significant effect on a European site or European offshore marine site (either alone or cumulatively with other projects), the regulator may be required to undertake a Habitats Regulations Assessment (HRA) under:
- [The Conservation of Habitats and Species Regulations 2017](#) in England and Wales
 - Habitats Regulations 2010 and [The Conservation \(Natural Habitats &c.\) Regulations 1994](#) in Scotland, or
 - [The Conservation \(Natural Habitats & c.\) Regulations \(Northern Ireland\) 1995](#) in Northern Ireland
 - [The Conservation of Offshore Marine Habitats and Species Regulations 2017](#) in the UK offshore area
- 6.13 The applicant must provide adequate information to help the regulator make its assessment of whether the proposed operations are likely to have a significant effect on the integrity of a European site or European offshore marine site.
- 6.14 Information assembled for an AEE that is relevant to a subsequent HRA must be presented in the AEE in a format that can be readily extracted for the HRA.
- 6.15 If an HRA is required, the regulator is entitled to ask the applicant for any further information it deems necessary.

Section 7: Requirements on licensees after a licence is granted

- 7.1 The licensee will be responsible for ongoing monitoring of environmental effects across all environmental zones of influence, throughout its operations.
- 7.2 Specific licence conditions may require the licensee to:
- monitor and report on certain environmental effects, to ensure the actual emission levels do not exceed the predicted emission levels outlined in the AEE. For example, there may be a requirement to measure noise levels at specified locations and report the measurements to the regulator following launch or a series of launches. If the data illustrates noise levels greater than anticipated in the AEE and these are in an area of noise sensitive species, then action may be required
 - monitor air quality and water quality to ensure compliance with local, national and international requirements
- 7.3 Under [section 26](#) of the Act, the regulator is responsible for monitoring spaceflight activities, the operation of spaceports and any associated activities to ensure compliance with any conditions set in licences it issues. To fulfil this duty, the regulator may require the licensee to submit specific monitoring data to demonstrate its compliance with the licence conditions.

Material change

- 7.4 The regulator intends (subject to the consultation required by section 13(6) of the Act) to attach a material change condition to every spaceport licence and launch operator licence. This condition will require the licensee to submit a revised AEE if there has been a material change to the original environmental baseline by which the AEE has been assessed. For example, if monitoring highlights that the environmental effects are more significant than predicted, the AEE may need to be updated. In this instance the applicant should contact the regulator immediately.
- 7.5 In addition, licence conditions may require a revised AEE under specific circumstances, including but not limited to:
- following an accident or incident at the spaceport and/or during launch
 - following an accident or incident that has occurred elsewhere and which may affect the environmental baseline upon which the AEE was conducted
- 7.6 A revised AEE may also be required if the licensee wants to change the licensed activities, for example, using a different launch vehicle.
- 7.7 If the environmental effects are less significant than predicted, licensees are entitled to apply to vary the licence to increase the launch allowance or frequency limit.
- 7.8 If any material change is identified, the regulator is entitled to suspend the activities until a revised AEE has been submitted and the regulator has approved it.

Annex A: Example Template for an AEE

Section	Content
Cover page	Show the following information: <ul style="list-style-type: none"> • document title • final date of document • name and contact details of principal author • name of individual/organisation who commissioned the report • document reference number and version number
Contents table	Include page numbers for each section and sub-section, figures and appendices.
Non-technical summary	Write a summary that explains the purpose of the AEE, in non-technical language as much as possible, avoiding technical terms, detailed data and scientific discussion. This should include a description of the proposed operations, methodology/methods, key findings of the assessment including key impacts, mitigation measures and conclusions.
Introduction	Statement of expertise and qualifications of the principal author and competent experts who contributed to the AEE; reference to any previous AEEs or assessments submitted, to support the AEE, under s.11 (4); Clear purpose of the document; <ul style="list-style-type: none"> • to identify and describe all potentially significant environmental effects associated with the proposed operations • to set out mitigation measures required to address any potentially significant environmental effects • to identify how mitigation measures will/could be secured • to provide an assessment of the significance of any residual effects • to identify appropriate enhancement measures
Scope of assessment	Clearly describe and signpost: <ul style="list-style-type: none"> • each environmental topic to be considered • for a spaceport AEE, the proposed environmental budget, with the maximum number and frequency of intended launches by type • for a launch operator AEE, the maximum number and frequency of intended launches by type • 'environmental zones of influence' - areas where effects will be assessed • description of the launch vehicle(s) that will be operated, its concept of operations and flight profile • mitigation measures • cumulative effects

Assessment methodology	<p>Provide brief description of the methodology of the assessment, to cover:</p> <ul style="list-style-type: none"> • a description of the study area • names of individuals or organisations that have been engaged with • date(s) of relevant surveys, names and qualifications of surveyors • how significance has been determined • how the environmental zones of influence have been determined • approach to gathering information on the launch vehicle(s) • the years the assessment was based on and therefore for which the environmental baseline conditions have been described (this should be as recent as possible) • any limitations and data gaps.
Environmental baseline conditions	<p>Clearly describe the environmental baseline conditions for all environmental topics. These are the conditions prior to the proposed spaceflight activities taking place.</p>
Description of proposed project	<p>Provide a detailed description of the proposals, including detailed descriptions of the launch vehicle(s) and intended payloads that will be launched, its concept of operations including ground and flight activities and flight profile including provisional ground track. Include a description of how the operations have been designed (and alternatives) to avoid/minimise environmental effects, if relevant.</p>
Assessment of effects and mitigation measures	<p>Clearly identify and describe all the potential effects of the proposed activities against the environmental topics identified.</p> <p>Clearly assess and provide the conclusion as to the significance of the activities' environmental effects against each environmental topic (<i>without</i> mitigation).</p> <p>Clearly assess and provide the conclusion to the significance of the activities' environmental effects against each environmental topic (<i>with</i> mitigation) and identify any residual effects. This should comprise a description of the effect and a statement of the geographical level at which the effect is likely to be significant (e.g. significant at the national level, significant at the county level, not significant etc).</p> <p>Provide a summary table listing the significance of residual effects for each environmental topic, the mitigation measures required and the means by which mitigation measures can be secured to allow the regulator to ensure that appropriate licence conditions are included.</p>
Cumulative effects	<p>Clearly identify, assess and describe any cumulative environmental effects of the activities under the proposed licence, cumulative effects with other spaceflight activities and cumulative effects with non-spaceflight activities and determine the significance.</p> <p>Clearly list any further mitigation proposals that might be required and how they will be secured.</p>

Conclusions	<p>Clearly conclude the overall environmental effects of the proposed operations and where possible where these will be avoided, mitigated or compensated.</p> <p>Provide evidence on how the proposed activities will be compliant with relevant legislation.</p> <p>Explain clearly what the likely outcomes are for the environment if the proposed licence is granted. Such implications may be presented as a table and/or as a statement of '<i>net losses and gains</i>' and should provide the decision maker with a clear understanding of the likely consequence for the environmental topics or receptors (e.g. habitats or species) to be affected significantly by the proposals.</p>
References	List and appropriately reference all documents referred to in the AEE.
Figures	Provide any significant figures to support the AEE.
Appendices	Add any significant documents as appendices.