
Non-geostationary satellite earth stations

Licensing guidance

Contents

Section

1. Overview	1
2. Licensing process	7
3. Licence conditions	15
4. Additional obligations and support	18
5. Contact details	20
6. Document history	21

1. Overview

- 1.1 One of our major priorities is getting everyone connected. The deployment of satellite broadband systems operating in non-geostationary satellite orbit (NGSO) could enable people and businesses in the UK to access a range of high-capacity services, including home broadband, Wi-Fi onboard aircraft, ships and trains; backhaul for mobile phone services and Internet of Things for enterprises. NGSO satellite services could be particularly beneficial in remote areas which do not have reliable mobile or fixed broadband.
- 1.2 These NGSO systems are technically more complex than earlier satellite broadband systems as they use many hundreds, if not thousands, of satellites orbiting the Earth. Satellite dishes on the ground need to track these satellites as they move across the sky, unlike other satellite networks where the dishes are fixed pointing at a single satellite which is stationary in the sky. This means it is more complex for NGSO satellite operators to agree how to operate their networks without causing harmful radio interference to each other. They are required to do this under the International Telecommunication Union (ITU) Radio Regulations, although agreements are often difficult to achieve. This creates a risk that interference between NGSO networks could cause localised degradation to the quality and reliability of these services.
- 1.3 To address these challenges and risks, we have updated our approach to licensing NGSO systems to include checks on the interference and competitive impact.
- 1.4 On 10 December 2021, we published a Statement, [Non-geostationary satellite systems](#), setting out our approach to licensing satellite systems operating in NGSO in parts of spectrum at **Ku band**¹ and **Ka band**². On 15 September 2023, we published another Statement, [Satellite Earth Station Network licences](#), setting out further updates to the Earth Station Network licence conditions and introducing an additional question for the application process.
- 1.5 This guidance explains the process for licensing NGSO systems, which includes checks on the interference and competitive impact. It also explains which licences are subject to the licensing process, how much the licences cost, and what some of the terms and conditions of the licences are.
- 1.6 The process applies to the following licences:
 - a) the **Satellite (non-geostationary earth station)**. These licences authorise NGSO **gateway** earth stations which are large hubs that connect the satellite network to the internet and/or to private networks and cloud services. In the remainder of this document, we refer to this as the NGSO “**Gateway**” licence.

¹ Ku band satellite services typically use 10.7-12.7 GHz for downlink and 14.0-14.5 GHz for uplink.

² Ka band satellite services typically use 18-20 GHz for downlink and 27.5-30 GHz for uplink.

- b) the **Satellite (earth station network)** – for NGSO use.³ These licences authorise the use of NGSO **user terminals**, for example the dish and equipment installed at a customer’s premises, and must be held by any satellite operator wishing to deliver services in the UK. In the remainder of this document, we refer to this as the NGSO “**Network**” licence.

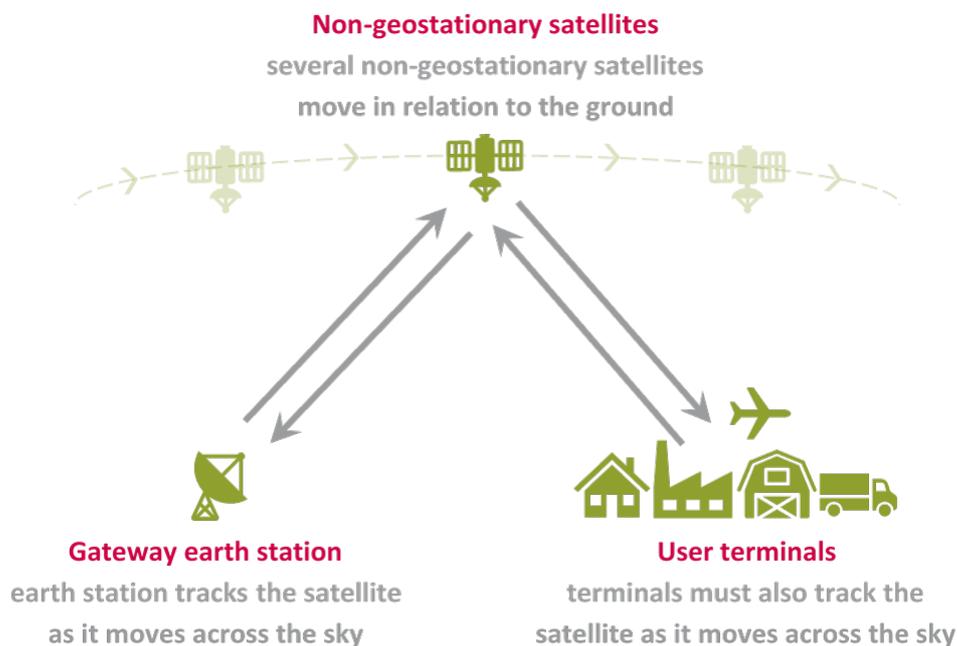
What are these licences used for?

- 1.7 The NGSO Gateway and Network licences are used to authorise gateway earth stations and user terminals that relay traffic via NGSO satellites orbiting the Earth. These satellite systems can provide direct-to-consumer broadband services; broadband services to businesses, telecoms operators and governments; and Internet of Things services for enterprises operating in extreme environments. Other examples of uses include delivering broadband services to aircraft and providing backhaul⁴ to mobile base station sites or to trains.
- 1.8 A NGSO satellite broadband system is made up of three components:
- One or more gateway earth stations which connect the satellite broadband network to the internet or private network.
 - Several satellites used to relay traffic between the gateway and user terminals.
 - User terminals to provide broadband connectivity to end users, typically comprising of an antenna and user equipment.

³ Applications for geostationary orbit (GSO) Network licences are not subject to the NGSO licensing process or the licence conditions related to NGSO use.

⁴ Backhaul is a service provided to broadband and mobile telecommunications companies which helps extend their network to hard-to-reach places.

Figure 1: Key elements of a NGSO satellite system



Who can hold these licences?

- 1.9 A NGSO Network licence should be held by someone who has control over the whole satellite network (including associated user terminals and gateway earth stations). This would normally be the satellite operator. The licensee should have the ability to negotiate and agree coexistence arrangements with other licence holders, so that they are able to comply with the conditions in the licence.
- 1.10 Network licences operating to GSO networks are not valid for NGSO networks. A satellite operator which plans to operate an NGSO network will need to apply for a new network licence through the process outlined below. A reseller or service provider who currently holds a network licence will not be able to hold an NGSO network licence. They should only connect to NGSO satellite services with a valid NGSO network licence.
- 1.11 A NGSO Gateway licence should be held by someone who has control over the gateway earth station, for example a satellite operator or teleport operator. The NGSO Gateway licence must only operate with a satellite system for which a network licence has been issued.
- 1.12 We note that in principle some NGSO gateways in the UK might operate with an NGSO satellite system that does not, and does not intend to, provide services in the UK at all, and therefore would not normally apply for a UK network licence. In these cases, we encourage such gateway applicants to discuss this with us prior to application.

Where can licences be used

- 1.13 The NGSO Gateway and Network licences are generally available in all parts of the UK, and also in the Crown Dependencies (Guernsey, Jersey and the Isle of Man).
- 1.14 There are restrictions at some locations, including in the vicinity of MoD sites and airports, which require protection from the high intensity radio emissions that earth stations produce. When we process a NGSO Gateway licence application, we will carry out the necessary radio site clearance process to determine if these sensitive sites can be protected. For the NGSO Network licence, the conditions related to the protection of sensitive sites are incorporated into the licence and it is the responsibility of the licensee to meet those conditions.
- 1.15 As explained in our Statement, [Satellite Earth Station Network licences](#), the ESN licence authorises earth stations:
- On land (within the UK, the Channel Islands or the Isle of Man);
 - On offshore energy installations which are within the UK territorial sea and also to those which are outside UK territorial sea (and the territorial seas of the Channel Islands and Isle of Man) but within the UK Continental Shelf (as set out in The Civil Jurisdiction (Offshore Activities) Order 1987); and
 - On any vessel or aircraft (which is within or above the territory of the UK or within or above the territorial seas of the UK, the Channel Islands or the Isle of Man)⁵.

Channel Islands / Isle of Man regulators

- 1.16 For commercial broadband telecommunications, regulation falls to local regulators. For the Isle of Man this is the [Communications and Utilities Regulatory Authority](#); for the Channel Islands this is the [Jersey Competition Regulatory Authority](#) and the [Guernsey Competition and Regulatory Authority](#).
- 1.17 Those who wish to supply NGSO broadband services need first to apply to the relevant island regulator for a telecommunications licence. Island regulators may conduct a consultation or a competitive process before deciding to award such a licence. Ofcom, however, remains responsible for issuing spectrum licences. The award of the telecommunications licence from the island regulator is usually granted, conditional on the applicant being successful in applying for the spectrum licence from Ofcom.
- 1.18 The operator would then need to apply for the relevant NGSO Gateway and Network licences using the process outlined in this document. This might include our own

⁵ Stations on an aircraft or vessel which is registered in the United Kingdom, Channel Islands and Isle of Man and which is outside those territories and outside their territorial seas are not authorised under this licence but may be separately authorised under wireless telegraphy licences for that individual vessel or aircraft. Radio equipment on foreign vessels and aircraft which are for the time being within the limits of these places [the UK, the Channel Islands or the Isle of Man] and their territorial seas may be exempt for wireless telegraphy licensing see <https://www.legislation.gov.uk/uksi/1998/2970/made>

competition assessment, in which we would consider the implications for competition in the UK.

Frequency bands

NGSO Gateway licence

- 1.19 The NGSO Gateway licence is available in the uplink (transmit) parts of Ku band (14.0 – 14.5 GHz) and the following parts of Ka band:
- 27.5–27.8285 GHz
 - 28.4445–28.8365 GHz
 - 29.4525–30 GHz
- 1.20 Where applications for Gateway licences include receive frequencies for the earth stations, we will generally only take into account and coordinate these in bands shared with fixed links if the total amount of receive bandwidth does not exceed the total amount of transmit bandwidth.

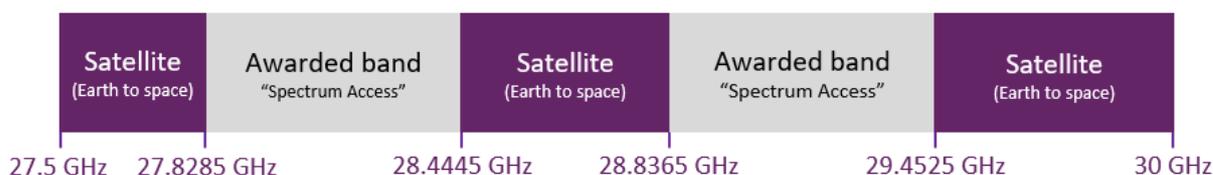
NGSO Network licence

- 1.21 The frequency bands available for use under a NGSO Network licence are listed in the licence conditions, as follows:
- For **land station(s)** (including stations on vehicles and trains), station(s) on offshore installations and **maritime station(s)** operating with non-geostationary satellites, the available frequency ranges are: 14.0–14.5 GHz, 27.5–27.8185 GHz, 28.4545–28.8265 GHz, and 29.5–30 GHz.
 - For **aeronautical stations** operating with non-geostationary satellites, the available frequency range is 14.0–14.47 GHz.

Access to other parts of Ka band spectrum

- 1.22 As shown in Figure 2, parts of the Ka band spectrum in the awarded bands (shown in grey), excluding some guard bands, have been awarded on a technology neutral basis. Further information about the holders of these ‘Spectrum Access’ licences, including the specific frequency bands and geographic areas can be found [here](#). Further background information can be found on the [Mobile and wireless broadband](#) page of Ofcom’s website.

Figure 2: 28 GHz band diagram



- 1.23 The Spectrum Access licences are technology neutral and allow the spectrum to be used by transmitting satellite earth stations. The licences are also tradable (both leasable and transferable) which means that earth station operators can access the spectrum by making commercial agreements with the Spectrum Access licence holders. Leasing is a contractual matter between parties and does not involve us, with the Spectrum Access licensee remaining legally responsible for ensuring compliance with licence conditions. A spectrum transfer is also on terms agreed commercially between parties, followed by submission of the appropriate trading application form to us, who will revoke the previous Spectrum Access licence (or vary it if only trading part of the rights) and grant a new licence to the purchaser. More information and guidance about spectrum trading can be found in our [trading guidance notes](#) (OfW513).

Licence fees

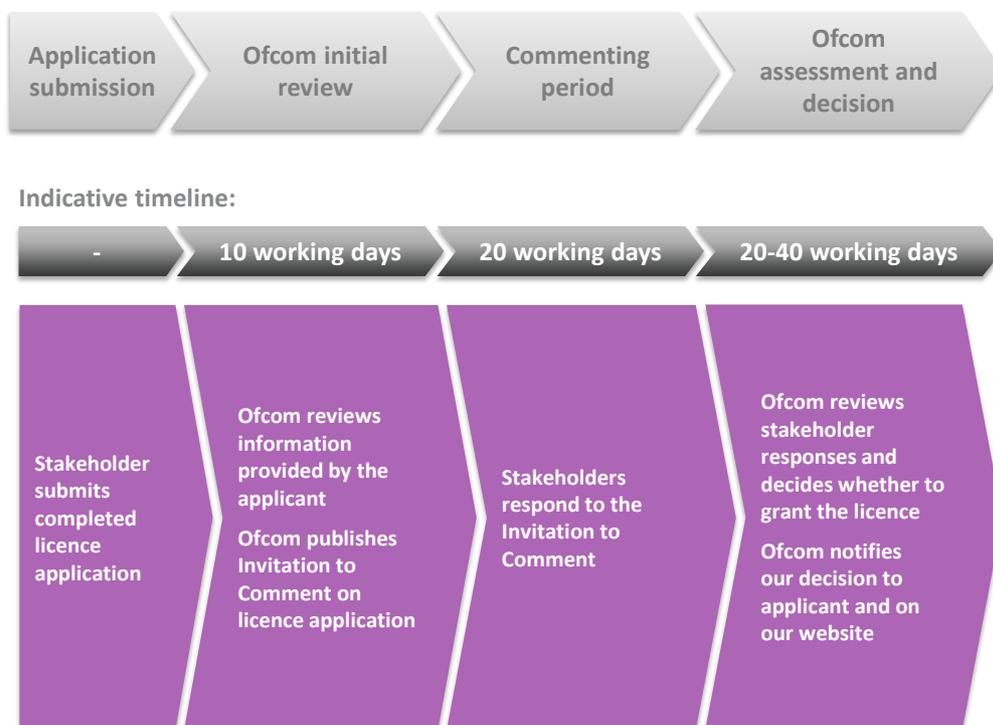
- 1.24 We charge fixed, cost-based fees for NGSO Gateway and Network licences as follows:
- £500 per year for a NGSO **Gateway** licence.
 - £200 per year for a NGSO **Network** licence.

2. Licensing process

Introduction

- 2.1 The licensing process described in this section applies to applications for new NGSO Gateway and Network licences as well as variations to existing licences (e.g. changing the number of antennas at a particular site). In summary, the key elements of the process are:
- a) to check that systems being licensed can coexist without degrading consumer services;
 - b) to check whether granting a licence could prevent subsequent parties entering the market; and
 - c) to publish applications for any NGSO licences which we expect to grant and allow a period for comments where stakeholders can provide information regarding interference or competitive impact.
- 2.2 An overview of the process for obtaining a licence is shown in Figure 3 below and further explanation is provided in the proceeding sub-sections. The process is complemented by licence conditions for NGSO Gateway and Network licences, as set out in Section 3.
- 2.3 We recommend early engagement with Ofcom (and relevant parties) to ensure this will not hinder deployment plans.

Figure 3: Overview of process



Apply for a licence

- 2.4 Applicants should fill in and submit the relevant application form:
- a) For a NGSO **Gateway** licence – form [OfW564](#), including one or more earth station [deployment spreadsheets](#).
 - b) For a NGSO **Network** licence – form [OfW602](#).
- 2.5 Applicants are required to provide information about coexistence and, optionally, may provide information about the competitive impact of their proposed non-geostationary earth stations, as explained in the following subsections.
- 2.6 If applicants or licensees wish to engage with someone in another organisation but don't know the relevant individual, we will endeavour to provide contact details.

Coexistence with existing systems

- 2.7 To assure the quality of the service of existing UK services, applicants must demonstrate how coexistence is possible between their proposed NGSO Gateway or Network and:
- a) existing non-geostationary satellite systems⁶ that are already licensed in the UK;
 - b) non-geostationary satellite systems for which an application has been made and which has been published for comment on Ofcom's website; and
 - c) other specific co-frequency earth stations registered with the ITU.
- 2.8 You can find [information about all these systems](#) on our website.
- 2.9 To demonstrate coexistence:
- a) The preferred way is for applicants to have an agreement with the relevant licence holder(s) already. This would ideally be an ITU coordination agreement, but it could also be a local cooperation agreement allowing the systems to coexist in the UK⁷.
 - b) If no such agreement exists, applicants should specify in detail how it would be possible for the different systems to coexist. They should provide evidence that reasonable measures can be put in place - **by either the applicant, the existing licensee, or by both** - to achieve coexistence. Specifically, applicants should provide enough evidence to demonstrate that the impact to existing licensees in terms of increased unavailability and of reduction in throughput would be modest.
- 2.10 The evidence provided by applicants is likely to include a comparison of the unavailability and throughput⁸ of existing licensees before and after the mitigation measures have been put in place. Nevertheless, applicants are encouraged to choose the evidence that best

⁶ A "non-geostationary satellite system" refers to non-geostationary gateways and user terminals which can be licensed in the UK under a "Satellite (Non-Geostationary Earth Station)" licence and "Satellite (Earth Station Network)" licence respectively.

⁷ In either case, Ofcom will check with the other party that the agreement does exist.

⁸ Examples of the use of the unavailability and throughput metrics can be found among others in Recommendation ITU-R S.1323, and in Resolution 770 (WRC-19) in the Radio Regulations.

illustrates their impact on existing licensees on a case by case basis. As an example, if applying for a single gateway licence hundreds of kilometres away from existing licences, applicants may find simpler forms to demonstrate that coexistence is possible.

- 2.11 Parts of this evidence could be provided on a confidential basis if necessary. However, we strongly encourage applicants to make information publicly available as far as possible, so that stakeholders are able to understand the impact of an application and make informed responses to the Invitation to Comment.
- 2.12 Applicants should provide sufficient evidence to support the claim that such measures are reasonable, and that they make coexistence possible. If measures are to be put in place by an existing licensee, these should be reasonable, taking into account the relative position of both systems within the ITU process. However, earlier filed systems should not seek to place unreasonable restrictions on the provision of services to people and businesses in the UK by later filed systems, especially if their own systems are relatively early in their development.

Coexistence with future systems

- 2.13 Our intention is to encourage the deployment of future NGSO networks. We do not expect licensees to foresee the characteristics or the number of future systems that will apply for a licence in the UK, or how other systems may evolve.
- 2.14 In this section applicants should:
- a) explain how their existing network design and operating model might facilitate coexistence with other NGSO satellite systems⁹ and any limitations;
 - b) outline any additional measures, which would allow improved coexistence with other systems (for example, planned roll out of ground equipment, future network designs); and
 - c) be aware that under our rules they may be expected to take reasonable measures to accommodate such future applicants, in order to avoid material degradation to services in the UK.

Competitive impact

- 2.15 In carrying out the competition check, our ultimate focus is the impact of approving the licence application on consumers, customers and citizens in the UK.
- 2.16 Applicants may choose to provide information on the competitive impact of issuing them a licence (combined with other non-geostationary satellite system licences held or applied for by the applicant), in particular on:

⁹ This could include use of specific technologies, aspects of network design, choice of commercial services or operational measures that might allow other NGSO operators to also serve UK people and businesses.

- a) the benefits that their NGSO system can bring to UK people and businesses. Possible benefits might include:
 - i) improvements to your services,
 - ii) greater choice and/or allowing the applicant to compete more effectively in the UK; and
 - iii) how the NGSO system may benefit its customers (e.g. a communications provider that uses the NGSO system for backhaul) as well as end consumers (e.g. the ultimate users of that communication provider's services) and possibly citizens more generally (e.g. if that communication provider's services are of wider benefit to society).
 - b) any risks to competition in the UK. This may refer to how the applicant intends to mitigate any risks to competition, including their ability to coexist with other non-geostationary satellite systems, including giving a sense of the scale of any costs of coexistence for other operator's systems.
- 2.17 The response to these questions may cross-refer to material provided elsewhere in your application, for example on coexistence.
- 2.18 It is for applicants to take a view on what information would be most relevant for our assessment of their particular licence application.

Protection of other services

- 2.19 To assure the quality of the service of other existing UK services, applicants for NGSO **network** licences must demonstrate, where relevant, how their NGSO system will protect the following users of spectrum in the UK:
- a) Geostationary satellite systems;
 - b) radio astronomy in the 10.6-10.7 GHz band; and
 - c) fixed links in 17.7-19.7 GHz.
- 2.20 Protection of these users is a condition of the NGSO network licence.
- 2.21 To demonstrate protection of GSO systems, the preferred way is for applicants to provide evidence that their NGSO system complies with the relevant equivalent power flux-density (epfd) limits in Article 22 of the ITU Radio Regulations in the relevant bands.
- 2.22 To demonstrate protection of radio astronomy in the 10.6-10.7 GHz band, the preferred way is for applicants to provide evidence that their NGSO system can suppress satellite transmissions in the channel immediately adjacent to 10.7 GHz. See also ECC [Report 271](#).
- 2.23 To demonstrate protection of fixed links in the 17.7-19.7 GHz band, the preferred way is for applicants to provide evidence that their NGSO system complies with the relevant power flux-density limitations in Article 21 of the ITU Radio Regulations in the space-to-earth direction.

- 2.24 In all these scenarios, applicants are recommended to provide at least a high level explanation of the methodologies to mitigate interference and/or technical evidence to demonstrate compliance.

Ofcom initial assessment

- 2.25 Once we have confirmed that the application is complete, we will make an initial assessment of the material submitted. Our aim will be to identify:
- a) whether the applicant has a fully considered plan for how coexistence can be achieved; and
 - b) whether they have provided sufficient information about that plan such that other parties (including Ofcom and other licensees) can take a view as to its credibility.
- 2.26 Where an applicant has said that an agreement with another party exists, we will check with the other parties to confirm this.
- 2.27 We may also identify any aspects of the application that are of particular interest (or concern) in relation to a) coexistence or b) competition so that they can be set out in the Invitation to Comment.
- 2.28 If necessary, we will request clarifications or additional information from the applicant prior to publishing the Invitation to Comment. If we have significant concerns at this stage, which are not able to be resolved through clarifications and additional information then we may not progress the application.
- 2.29 This phase should take 10 working days. It may be extended if we need to clarify parts of the application.

Commenting period

- 2.30 At this stage we will publish the application form on [our website](#). We may also identify any aspects of the application that are of particular interest (or concern) in relation to a) coexistence or b) competition so that they can be set out in the Invitation to Comment. All personal information and confidential information will be removed from the application document prior to publication.
- 2.31 A short commenting period will then begin and will normally run for twenty working days. If the standard timeline needs extending (for example to take into account a holiday season), updated deadlines will be published at this stage.
- 2.32 Licence holders and other applicants will be notified that a new application has been received and is open for comment. We will also inform other stakeholders who have signed up for this service.
- 2.33 A response form will be available on our website for stakeholders to fill in. Response forms should be submitted to ngso.licensing@ofcom.org.uk.

- 2.34 Each licence application will have its own separate commenting period, so it is possible there may be multiple commenting periods running in parallel.

How to respond during a commenting period

- 2.35 In relation to the **coexistence check**, if a stakeholder has concerns then we would encourage their response to:
- a) provide evidence as to why the coexistence measures provided by the applicant will not succeed in limiting the impact to existing licensees.
 - b) explain if the coexistence measures provided by the applicant can be regarded as insufficient or unreasonable and why.
- 2.36 In relation to the **competition check**, if a stakeholder has concerns then we would encourage it to cover the following material in its response:
- a) A description of its NGSO system and details of its UK commercial strategy. For example, what services it offers and details of any plans to expand in its UK operation (or when it intends to start providing services in the UK if it is not doing so already).
 - b) An explanation of why granting the licence application would affect rival operators and ultimately weaken the competitive constraint they would otherwise exert. This may refer to the evidence provided in relation to the coexistence check.
 - c) Describe what decision it thinks we should take. For example, whether we should refuse the licence application or approve it provided that certain modifications are made.

Ofcom decision

- 2.1 At the end of the commenting period, and taking account of stakeholder responses, we will decide if there is any reason not to grant a licence, or whether a further assessment is needed.
- 2.2 Whether a more detailed assessment is warranted will depend on the circumstances of each particular application. Circumstances where a further assessment may be needed include:
- a) **Technical check**: where we receive one or more credible, reasoned responses to the Invitation to Comment that call into question the ability of systems to coexist without causing harmful interference.
 - b) **Competition check**: where we receive one or more credible, reasoned responses to the Invitation to Comment that approving the licence application may pose a material risk to competition (although there may be situations where we depart from this

position¹⁰). For the avoidance of doubt, this threshold is not met if some stakeholders simply object to the licence application. Rather, those objections need to be credible and reasoned. Issues unrelated to competition will not pass this threshold.

2.3 In contrast, we will proceed straight to a decision where we:

- a) have sufficient evidence at this stage to do so; and
- b) can do so with limited further analysis.

2.4 For gateway applications, if we believe that specific adjustments can be made to the original application to mitigate any impact on coexistence and competition, we will discuss this with the applicant. If the applicant agrees to these adjustments, we will grant the licence. This approach will only be possible for a Gateway licence application, where technical limitations (e.g. frequency, bandwidth, power) can be tailored to each licence.

Granting a licence

2.5 Applicants who are successful can expect to receive a decision and a copy of their licence at the end of the decision window indicated. This licence will also be made available on our NGSO licensing website for future applicants.

2.6 We will also provide a list of the NGSO licensees operating on co-frequency channels that you will be expected to cooperate with as a condition of your licence.

Timeline

2.7 We aim to follow the indicative timeline shown in Figure 2, however we may need to extend these timings in certain situations, for example if the coexistence and competition assessment is particularly complex or if we were to receive multiple licence applications in quick succession. If we need to allow a longer commenting period, we will do this by setting an appropriate closing date when we publish the application for comments.

How we process licences

2.8 We will process licence applications in the order in which we receive them. As a result, we will consider each (complete) application in the context of existing issued licences and earlier applications.

2.9 If the application is not completed correctly, or if the information set out above has not submitted, we will ask the applicant to provide additional information where appropriate and to re-submit their application.

¹⁰ There may be situations where we depart from this position. For example, an application might be for such a large number of gateways and/or the coexistence challenges presented by those gateways might be so clear cut that we have competition concerns even without any third-party objections.

Multiple applications in quick succession

- 2.10 There may be instances where we receive an application that hasn't taken into account an earlier application because the earlier application has only recently been received by us and hasn't yet been published. In these instances, we will ask the later applicant to revise their application once the earlier application has been published. This may result in delay to processing applications.

Gateways operating to new NGSO satellite networks

- 2.11 All NGSO gateways must operate to UK-licensed NGSO networks.
- 2.12 For a new satellite network, applications for a gateway and a network licence may be submitted simultaneously. They will each follow their own, independent assessment. This means:
- a) The gateway licence (if approved) will be granted and issued at the same time as the network licence (so may be delayed if the network requires further assessment);
 - b) If the network licence application is unsuccessful, the gateway licence will also be denied;
 - c) A network licence may be authorised even if the gateway licence needs to be resubmitted.

3. Licence conditions

Existing conditions

- 3.1 We have published licence conditions for the NGSO network and NGSO gateway licences on our [website](#).¹¹ You should ensure that you understand and can meet these conditions.
- 3.2 Additional licence conditions for the NGSO network and NGSO gateway licences are laid out separately below.

Additional licence conditions for NGSO network licences

- 3.3 Our additional conditions for NGSO licences aim to:
- require NGSO licensees to cooperate with the other NGSO licensees operating in the same frequencies so they can coexist.
 - require operators to take action in cases of interference between NGSO systems which impacts the provision of services to users in particular location(s) in the UK.

Use of frequencies in common and requirement to cooperate

- 3.4 As a number of NGSO satellites may be licensed to operate in the UK, these systems may overlap in some or all of the frequencies that they operate in. The overlapping frequencies could include bands used for links between satellites and gateway earth stations and/or bands used for links between satellites and user terminals. Therefore, conditions 1 and 2 outline the need for systems to co-exist and operate in the United Kingdom without causing harmful radio interference to each other.
- 3.5 It is important to note that although the Network licence is authorising the use of the user terminal to satellite links, the requirement to cooperate applies to the **whole system** (satellites, earth stations and user terminals).
- 3.6 Satellite network coordination as required under the ITU Radio Regulations is the most important element of the cooperation needed, although this may not always be sufficient for services in the UK. This is because the Radio Regulations only deals with coordination between different countries and does not deal with the specific locations of gateway earth station sites within the UK, where significant physical separation may be required.
- 3.7 As coordination discussions can take many months, we would wish to see evidence that they are progressing in a timely fashion and that both parties are participating constructively. We may ask licensees for evidence of the progress of these discussions and may facilitate discussions between operators.

¹¹ All licence holders must also comply with general licence conditions [Wireless Telegraphy Licence Conditions Booklet OfW597](#).

- 3.8 Failure to cooperate under condition 2, “such that network services can be provided to end users” will increase the likelihood that user services will be disrupted such that the conditions 3-5 (discussed below) are triggered.

Requirement to comply with notice if services are degraded

- 3.9 Conditions 3-5 enable us to require operators to take action, including requesting a change of frequency if needed, in cases of interference between NGSO systems which materially degrades the provision of services to users in specific location(s) in the UK.
- 3.10 When considering whether to take action, we would take into account:
- whether there is a material and recurring (or ongoing) degradation of services to users in the UK. This depends on the nature of the service being offered. Some examples of evidence we would consider include degradation to availability, throughput and signal to noise ratio at the user terminal.
 - the timing of degradations to user services and the correlation of that timing with (predicted) in-line events between NGSO systems.
 - whether operators have attempted to resolve issues between themselves and whether it is possible for them to do so before we resort to regulatory action. We will aim to ensure that any action we do take is evidence-based and proportionate.
- 3.11 The specific action we will require will depend on the situation, but could include changing the frequencies used by earth stations at specific location(s), changing the power level used by a particular earth station, introducing an angular separation between satellite systems or – in the most extreme cases – switching off equipment.
- 3.12 Factors we will take account of would include statutory duties, including ensuring the optimal use of spectrum, and the UK’s responsibilities under the ITU Radio Regulations including, where appropriate, the status of the filings supporting those systems.

ITU obligations

- 3.13 For the avoidance of doubt, the licensees holding Wireless Telegraphy Act licences, including the Network licence discussed here, may separately have obligations stemming from the ITU Radio Regulations. The conditions in this licence do not affect these obligations.

Additional licence conditions for NGSO gateway licences

- 3.14 The purpose of the additional licence conditions for NGSO gateway licences is similar to the conditions outlined above. There are some differences due to the typical holders of these licences compared to network licences.
- 3.15 Overall, the new terms that will come into effect will:
- Require the radio frequencies authorised to be used in common with other licensees.
 - Require that the earth station must only be used to communicate with a satellite system which has transmissions authorised by a network licence.

- Require operators to take action in cases of interference between NGSO systems which impacts the provision of services to users in particular location(s) in the UK.
- Require licensees to commence and maintain transmissions within 12 months.

Requirement to use frequencies in common with other licences

- 3.16 The same condition 1 of NGSO network licences applies to gateway licences, for the same reasons. However, as gateway licences are typically held by teleport operators, if licenced, the licensee may not have control over the wider satellite network and therefore does not take responsibility for coordination discussions with other satellite operators. Consequently, condition 2 of the network licences does not apply here.

Requirement to only operate with a system covered by a network licence

- 3.17 The entity holding the network licence should be responsible for cooperation, ensuring the gateway can coexist and operate without causing harmful radio interference to other satellite systems. Therefore, the gateway is required to only communicate with a satellite system that is covered by a network licence so that there is sufficient and appropriate cooperation.

Requirement to comply with notice if services are degraded

- 3.18 Conditions 3-5 of the gateway licence are similar to those that apply to the network licences and have a similar purpose. The only change is that condition 3 is simplified here to reflect that the licensee may be a teleport operator and, if so, will not (unlike a satellite operator holding a network licence) have control over other elements of the satellite system beyond the specific link authorised under this licence.

Requirement to commence and maintain transmissions within 12 months

- 3.19 An additional condition of the gateway licences is a requirement for gateway licensees to commence and maintain transmissions within 12 months of being issued a licence. This is to mitigate the risk of artificial scarcity if operators apply for licences far in advance of a potential need and never actually deploy. If spectrum is not used in this timeframe or is subsequently no longer used, we may revoke the licence with one month's notice.
- 3.20 We may no longer take this licence into account when assessing the interference that may be caused by a new site when considering a new licence application.
- 3.21 If the network operator wishes to recommence operations at that gateway, the gateway licensee would need to reapply for a licence following the application process for new applicants.

ITU obligations

- 3.22 As for the network licence, it is important to note that this licence does not affect any obligations that the licensee may have under the ITU Radio Regulations.

4. Additional obligations and support

- 4.1 The granting of an NGSO licence should not be seen as the end of the process. Our aim is for NGSO operators to deploy with confidence to the benefit of UK citizens and consumers.

ITU coordination/operational agreements

- 4.2 Licence-holders should continue to make efforts to reach agreements with other licence holders if these do not already exist.
- a) We will request an update on the progress of these discussions.
 - b) We will intensify discussions with licence-holders ahead of the deployment of terminals for a new service.
 - c) We may broker meetings with both parties if we feel this is necessary to speed a successful resolution
 - d) We reserve the right to take action if we feel one party is not negotiating in good faith.

Requests for information/input

- 4.3 Licence-holders will also, from time to time, be approached by new parties who will be seeking to operate in the UK. This may be prior to those parties applying for a licence. We would encourage all licence holders to share operational information regarding their systems and coordinate in good faith.
- 4.4 We would encourage licence holders to comment, where appropriate, on new NGSO applications.
- 4.5 We will continue to monitor the development of the NGSO market in the UK. We may, from time to time, request information from licence-holders regarding the deployment of their service.

Modifications to your network or gateway

Gateway variations

- 4.6 Applicants wishing to modify their gateway licence should submit a new application.
- 4.7 We will review applications to vary gateway licences (e.g. change the number of antennas at a particular site) on a case by case basis. If we feel the modification will materially impact the interference environment for other operators, we reserve the right to request the operator to submit a full application. We will review the application, publish it and run a new commenting period, as outlined above. This is both for transparency and for us to gather further evidence regarding the potential impact of this change to the network.
- 4.8 We recommend early engagement with us (and relevant parties) to ensure this will not hinder deployment plans.

Network modifications

- 4.9 Operators are less likely to need to submit requests to vary their network licence because it is a light licence which authorises a wide range of frequencies. However, network licences will be subject to an ongoing obligation (condition 2, discussed above) to cooperate and coexist with other NGSO licensees. An operator planning significant changes to their system (e.g. to operate with a much larger or smaller satellite constellation) could materially alter the interference environment for other NGSO licensees. We would expect operators to keep us informed and to cooperate with other licensees ahead of making such changes in order to ensure they can continue to coexist.

What to do if you experience interference?

- 4.10 We expect the majority of cases of interference can be resolved between operators.
- 4.11 Where cases of harmful interference and/or material degradation to the service arise, we may choose to investigate. This may result in a requirement for one or both parties to change the way in which they are operating, in line with conditions 3-5 of the licence. More information about [our approach to interference and enforcement](#) is available on our website.

5. Contact details

Space and Science Team

Ofcom

Riverside House

2a Southwark Bridge Road

London SE1 9HA

Website: www.ofcom.org.uk

Email: ngso.licensing@ofcom.org.uk

6. Document history

- 6.1 This is a live document, and we may change it from time to time to update it with new information. Any changes that are made to the document will be outlined in the document history table below.

Version	Date	Changes
1.0	December 2021	First published
1.1	8 November 2022	Update to frequencies available in the 14 GHz band