

Australian procedures for the coordination and notification of satellite systems

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Purpose, scope and background

Introduction

The International Telecommunication Union (ITU) is the United Nations agency which deals with the frequency coordination of satellites, among other duties. The ITU only deals with administrations, not with satellite operators. Australia is a signatory to ITU treaty-level arrangements. The Australian Communications and Media Authority (ACMA) acts as the Australian administration for the ITU's international process of management of frequencies for satellite communications. Satellite operators may approach any administration in the world, including the ACMA, to undertake this work. In Australia, this work is considered a spectrum management function under the *Australian Communications and Media Authority Act 2005* (ACMA Act). In undertaking this work, the ACMA also considers the regulatory framework provided by the ITU's treaty-level Constitution and Radio Regulations, other treaty-level agreements, and Australian law and principles.

Any information related to a satellite system submitted to the ITU by the ACMA remains the responsibility of the ACMA (for the Commonwealth of Australia) as only administrations of member states can submit, modify or suppress information related to satellite systems, and exchange coordination information with other administrations. Through submission of information to the ITU, the ACMA obtains practical "access" to deal with ITU published information associated with the satellite system and, if brought into use, the radio frequencies and orbit for the satellite system. The ACMA may, in accordance with this manual, provide for the exclusive use of an access for an Australian satellite system to a satellite operator. Satellite operators asking the ACMA to file their satellite system with the ITU should follow the procedures set out in this manual.

Purpose

This document *Australian procedures for the coordination and notification of satellite systems* (referred to as 'the manual') provides transparency about the procedures for the satellite industry to follow from the initial assessment of a proposed satellite system to the eventual cessation of the satellite system. However, while this manual sets out the procedures that the ACMA anticipates would normally be followed in relation to satellite filing and coordination in Australia, the ACMA reserves the right to deviate from these procedures should circumstances mean this is appropriate, for example, in response to a direction from the Minister under the ACMA Act.

Scope

In order to use a satellite to provide radiocommunications services to or from Australia, the following conditions must be satisfied:

- > the satellite system must have undergone international frequency coordination in accordance with the ITU Radio Regulations (regardless of whether Australia is the responsible administration)¹

¹ 'Responsible administration' is a term used by the International Telecommunication Union (ITU) for the country which submitted the satellite system.

- > the radiocommunications link must be authorised by a relevant radiocommunications licence issued by the ACMA.

This manual details the manner in which the ACMA and the satellite operator perform international frequency coordination and notification of satellite systems. This manual only applies to satellite systems where Australia is the responsible administration.

The *Radiocommunications Act 1992* (the Radiocommunications Act) requires that the operation of all radiocommunications devices, including Earth stations and space stations (that is, on satellites), be authorised by a licence issued by the ACMA.² A radiocommunications licence may not be issued unless international frequency coordination has occurred (or in some circumstances is occurring) and the device(s) will be operated in conformity with the satellite system. Further information on this topic is available from the ACMA website, www.acma.gov.au, but is not discussed further in this manual.

For some satellite services, the *Telecommunications Act 1997* (the Telecommunications Act) may require the grant of a carrier licence. Similarly, certain authorisations under the *Broadcasting Services Act 1992* (the BSA) may be required for certain satellite services. Further information on these topics is available from the ACMA website, but will not be discussed further in this manual.

Regulatory framework

This manual sets out a process for performing satellite filing and coordination work in accordance with a number of principles and obligations under which the ACMA operates.

These principles include those outlined in the Outer Space Treaty³, which states that freedom of exploration and use of outer space is for all states, on a basis of equality, in accordance with international law. In addition, outer space is not subject to national appropriation by claim of sovereignty, occupation, or other means.

Article 44 of the ITU Constitution is in the same spirit, stating:

...Member States shall bear in mind that radio frequencies and any associated orbits, including the geostationary-satellite orbit, are limited natural resources and they must be used rationally, efficiently and economically, in conformity with the Radio Regulations, so that countries or groups of countries may have equitable access to those orbits and frequencies, taking into account the special needs of the developing countries and the geographical situation of particular countries.

In addition to the ITU Constitution and Convention, the ITU administrative regulations (in particular the Radio Regulations) and international space treaties, the ACMA must at all times be guided by the following:⁴

- > the Radiocommunications Act
- > the ACMA Act
- > Australian administrative law.

The ACMA is also guided by its *Principles for spectrum management*.

² 'Radiocommunications device' is defined in the *Radiocommunications Act 1992*.

³ Formally known as the *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*.

⁴ This is not an exhaustive list.

Provisions of ITU regulations

Member states of the ITU (such as Australia) are bound by the administrative regulations of the ITU. These regulations aim to facilitate the rational, efficient and equitable use of the radiofrequency spectrum and associated orbits; and to prevent instances of harmful interference. These regulations include Articles 9 and 11 of the ITU Radio Regulations which set out administrations' obligations regarding coordination and notification of satellite systems. Specifically, they include time frames for submission of documents including Advance Publication Information, Coordination Request, and Notification information. This manual of procedures will not provide a list of the ITU administrative regulations. Further information is available from the ITU, www.itu.int.

International space treaties

The *Space Activities Act 1998* (the Space Activities Act) has incorporated aspects of the treaties listed below into Australian law. Some of the principles expressed in these treaties are particularly important to the international regulation of radiocommunications. The Space Activities Act outlines a separate area of domestic space regulation, with which the ACMA's space work interacts.

- > Outer Space Treaty (*Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*).
- > Rescue Agreement (*Agreement on the Rescue of Astronauts and the Return of Objects Launched into Outer Space*).
- > Liability Convention (*Convention on International Liability for Damage Caused by Space Objects*).
- > Registration Convention (*Convention on Registration of Objects Launched into Outer Space*).
- > Moon Treaty (*Agreement Governing the Activities of States on the Moon and other Celestial Bodies*).

The Radiocommunications Act

In performing spectrum management functions, such as satellite coordination, the ACMA must act in accordance with the Radiocommunications Act. Some of the relevant objectives of the Radiocommunications Act include:

- > maximising, through efficient use, the overall public benefit derived from using the radiofrequency spectrum
- > providing a regulatory environment that maximises opportunities for the Australian communications industry (in domestic and international markets)
- > providing a flexible and responsive approach to meeting the needs of users of the spectrum
- > supporting the communications policy objectives of the Commonwealth Government.

The ACMA Act

Section 9 of the ACMA Act sets out the spectrum management functions of the ACMA. Satellite coordination and notification work is considered a spectrum management function under the ACMA Act. The ACMA retains discretionary powers with respect to the assessment of applications and management of the coordination and notification process.

Principles for spectrum management

The principles are used to guide the ACMA's management of the radiofrequency spectrum within its existing legislative responsibilities and government policy settings. The principles do not, however, override the law.

The principles give guidance on providing for the maximum *overall public benefit* from the use of the radiofrequency spectrum. The principles should be considered as complementary to the Radiocommunications Act.

The principles are:⁵

1. Allocate spectrum to the highest value use or uses.
2. Enable and encourage spectrum to move to its highest value use or uses.
3. Use the least cost and least restrictive approach to achieving policy objectives.
4. To the extent possible, promote both certainty and flexibility.
5. Balance the cost of interference and the benefits of greater spectrum utilisation.

⁵ Further information is available from the ACMA web site www.acma.gov.au.

The ACMA procedures for assessing proposed new satellite systems

Application process

The following sections detail the processes of the ACMA for assessing proposed new satellite systems. As a guide, an applicant—regardless of whether they have existing satellite systems filed through Australia—must provide information addressing the assessment criteria, and have their application assessed. In some cases, coordination with other Australian satellite systems is required.

Limits to the number of applications

The ACMA is unlikely to approve a satellite operator having satellite networks in the coordination stage at more than four geostationary orbital locations, unless the operator can demonstrate that the number of locations is integral to their business plan and that the proposed networks would have substantive benefits to Australia. For clarity, this rule applies a count of orbital positions (not satellite networks—for example, six satellite networks at four orbital locations is considered acceptable—and does not include operational satellite networks notified to the ITU.

The Authority of the ACMA may relax this limitation in cases where the application of this rule could seriously impact the national interest—for example, to allow the Department of Defence to provide adequate communications infrastructure for Defence requirements.

Application form

In addition to the requirements outlined below, applicants are required to complete an application form. The application form is available on the ACMA website.

Assessment criteria

Potential satellite operators are required to address the following assessment criteria when requesting that the ACMA submit a new satellite system to the ITU on their behalf. This requirement applies whether or not the potential satellite operator already has satellite systems filed through the Australian administration.

The application must be complete and in sufficient detail to allow a proper assessment of the proposal.

The proposed satellite system must conform with:

- > the ITU Radio Regulations, any relevant administrative regulations of the ITU and the ITU Rules of Procedure
- > the *Australian Radiofrequency Spectrum Plan*.

The proposed satellite system must be consistent with all relevant Australian domestic radiocommunications policies (such as radiocommunications assignment and licensing instructions, and spectrum embargoes) and legislative instruments (such as frequency band plans and class licences) in effect at the time that the system becomes operational. Additionally, the impact of the proposed satellite system on existing Australian radiocommunication services (space and terrestrial) must be acceptable. Any inconsistencies between the proposed system and current domestic policy and legislation, and any incompatibility with existing

Australian radiocommunication services should be noted in the application, along with proposals to resolve the inconsistency or incompatibility (for example, the satellite operator may plan to provide the ACMA with a sharing scenario between current systems and their proposed system.) Satellite operators are strongly encouraged to take the initiative in this area.

The satellite operator must be a company that is incorporated in Australia under the *Corporations Act 2001* (the Corporations Act), carries on business in Australia and has management staff in Australia. Alternatively, the satellite operator may be a department of the Commonwealth or a Commonwealth agency, or a part of a state or territory government.

The satellite operator must remain able to exercise operational control of the satellite system from within Australia.⁶ This provision does not preclude the use of outsourced telemetry tracking and control (TT&C); the satellite operator, however, will remain the party responsible for meeting the requirement should such arrangements be made.

An applicant which has not previously had an application to submit satellite networks to the ITU approved by the ACMA must demonstrate that it has the technical and financial credentials required for the coordination of the satellite system and design of the physical satellite.⁷

The services that would be provided by the proposed satellite system, should it be brought into use, must provide substantive Australian benefit. This benefit should be limited to that derived from the use of the radiofrequency spectrum. Applicants must provide detailed claims against this assessment criterion. Examples of services which might be considered to provide substantive Australian benefit include:

- > the provision of a majority of a satellite service's capacity to Australians, particularly if this meets the needs of consumers that are under-served or not served
- > a service which assists an Australian government (or government agency) in performing its activities⁸
- > radiocommunications links to be used by recognised research bodies for the purposes of scientific research or environmental monitoring, or by Australian industries providing commercial services either exclusively into Australia or into other countries in addition to Australia.

The following list sets out the minimum amount of information to be supplied in an application, in order for the ACMA to be able to make an informed assessment of the request.

- > The ACMA requires detailed technical information about the proposed satellite system, including:
 - > advance publication information and, when available, coordination request data, in a form that would be ready to submit to the ITU, including relevant beam diagrams
 - > link budgets for typical configurations of the network

⁶ The meaning of operational control in this instance is the ability to control any aspect of the physical satellite and its radio emissions.

⁷ Design of the physical satellite here means the design needed to sign the satellite manufacture contract, rather than design of the satellite network (coverage areas, link budgets, beam patterns, etc).

⁸ This may be the Australian Government, or the government of a state or territory of Australia.

- > information on type of service to be provided
- > information about the amount of services to Australia compared to the amount of services not to Australia (if applicable).
- > Details of expected Australian coordination that would need to be achieved. Along with this, details of plans to resolve this coordination should be included.
- > A coordination strategy and evidence of sufficient technical skills to be able to perform coordination. This information must address both the coordination required to be able to successfully notify the satellite operator's satellite system, as well as coordination that arises from publication of details of foreign satellite systems published after publication of the Australian satellite system.
- > The ACMA may request applicants who have not previously had an ITU satellite network submitted by the Australian administration to provide a business plan or other evidence demonstrating a current ability to fund, at a minimum, the coordination of the satellite system and design of the physical satellite.
- > Brief details of planned TT&C operation.
- > If the satellite system is to provide services to multiple countries (that is, in addition to Australia), justification should be given as to why Australia is considered to be the most appropriate administration to file through.

Naming conventions

Satellite systems are to be named in a manner that is unambiguous. In no case should two satellite systems with different regulatory dates have identical names.

The ACMA prefers names that provide information about the network (such as identifying the satellite operator, type of service, generation of satellite, etc). The AUSSAT satellite network names provide a good example.

Requirements for 'planned band' applications

The term 'planned bands' means the specific frequency bands detailed in Appendixes 30 (BSS downlink)⁹, 30A (BSS uplink) and 30B (FSS services)¹⁰ of the ITU Radio Regulations. These bands have been comprehensively planned, applying the principle of equitable use—there are a small number of plan entries for every country, and the first-come, first-served principle does not apply. In this manual, the term 'planned bands' is inclusive of the plans detailed within the appendixes and any potential modifications to these plans.

Satellite networks subject to appendixes 30, 30A and 30B are subject to significantly different procedures from other satellite networks.

The ACMA may consider applications for satellite networks that are within the planned bands, on merit.

Such applications need not be strictly limited to the plan assignments contained in the Radio Regulations; applications for modifications or additions to the plan may also be considered. In such cases, however, further information should be provided in the application (in addition to the information against the other assessment criteria) detailing the compatibility between the proposed assignment and the Australian plan assignments.

⁹ 'Broadcasting Satellite Service' as defined in the ITU Radio Regulations.

¹⁰ 'Fixed Satellite Service' as defined in the ITU Radio Regulations.

Applications to make use of planned bands over the territory of another country will only be considered if accompanied by the approval of the administration of that country.

The ACMA may not submit any satellite network data to the ITU for planned band satellite networks until full approval of the satellite network has been granted by the ACMA. This is not the case for many unplanned band satellite systems for which the ACMA is able to submit advance publication information (API) data prior to approval by ACMA. This is because there is no API stage for planned band satellite networks.

Further requirements for non-geostationary satellite orbit applications

Satellite systems not subject to subsection IIA of Article 9 of the Radio Regulations

The ACMA will assess satellite systems that are not subject to coordination under subsection IIA of Article 9 in a manner similar to other satellite systems. The ACMA will not submit an API for such a satellite system until a favourable assessment has been made. The ACMA may also consult with other areas of the Commonwealth in reaching its decision.

Non-geostationary satellite orbit (NGSO) satellite systems that are subject to subsection IIA of Article 9 of the Radio Regulations

Applications to the ACMA to make use of NGSO orbits may include plans to bring into use one or more NGSO satellites. Such systems, by nature, are capable of providing services, not only to Australia, but also to other countries. A satellite operator intending to bring into use an NGSO system is therefore required to provide to the ACMA the following information in addition to that provided to address the assessment criteria:

- > the extent to which it is intended that services will be provided to Australia
- > the extent to which it is intended that services will be provided to other countries
- > justification for the choice of the ACMA as the responsible administration in the event that the satellite operator intends to provide part or all of its satellite services to other countries

NGSO satellite systems representing a constellation of NGSO satellites

When submitting an application to the ACMA for a satellite system consisting of a constellation of NGSO satellites, the applicant shall also provide details of the expected time required to bring into use all of the satellites of the constellation. If the application is approved, the ACMA and the satellite operator will develop one or more milestones to formalise the dates for the realisation of the entire constellation. Alternatively, in the event that the constellation as implemented differs from that included in the original application in any detail (such as number of satellites, orbital height, inclination, etc), the appropriate modification of the satellite system may be made to reflect the implemented NGSO satellite constellation. The ACMA recognises that many factors may affect the delivery of a constellation and suggests that these milestones be reviewed periodically by both parties.

Evaluation of application

The satellite coordination area of the ACMA may initially review the application. Incomplete applications may be returned to the operator without assessment.

Should the application be found to be complete, the satellite coordination area may make a preliminary assessment, and recommendation about whether to accept the application, to the relevant officer of the ACMA. The relevant officer may assess the

application against the assessment criteria and decide whether to accept the application. The relevant officer may impose conditions further to those detailed in this document, if and as required, to ensure that the regulatory framework that the ACMA must work within is satisfied. The relevant officer is as follows:

- > for applications from established operators with a track record of provision of services to Australia using Australian ITU satellite networks, the Executive Manager, Spectrum Infrastructure Branch
- > for applications from operators who have previously had filings approved by the ACMA but have not as yet brought these satellite networks into use or these satellite networks do not serve Australia, the General Manager, Communications Infrastructure Division
- > all other operators, the Authority.

Timing/ordering

An upfront, non-refundable charge is levied to assess an application from satellite operators who have not previously had an ITU satellite system submitted by Australia. The application may not be assessed before the payment of this fee. Work arising prior to the formal assessment process may be charged at the standard hourly rate.

Established satellite operators are charged for assessment of an application at the hourly rate for any requests that they make.

For satellite systems that must submit a coordination request (CR/C), the ACMA may submit advance publication information (API) to the ITU at the time that assessment begins.¹¹ This does **not** constitute agreement to support the satellite system by the ACMA; it is merely to make the best use of the mandatory six months between receipt (by the ITU) of the API notice and coordination request data.

In order to be assessed, the application must go through various ACMA processes. While workloads of the ACMA may significantly affect this process, it is expected that this process would take up to six months in the case of applications which require a decision by the Authority (rather than a delegate). For other applications, the ACMA aims to complete the assessment processes within one month of receiving an application. Satellite operators are encouraged to allow sufficient time for this work when planning their satellite systems.

The ACMA may not process an assessment of an application that could affect the assessment of another application that was submitted to the ACMA at an earlier date. In the unlikely event of multiple complete applications (for satellite systems with the potential to interfere with one another), being submitted on the same day, all satellite networks will be treated as requiring coordination with the other satellite networks. If coordination still cannot be completed between these networks, the ACMA will act as a decision-maker to resolve any outstanding issues. In relation to applications not submitted on the same day, applications will normally be assessed on their merits in the order of submission of a complete application to the ACMA.

The coordination data for a satellite system may not be submitted to the ITU until the ACMA has reached a favourable finding regarding the application.

Pre-application consultation with the ACMA

It is envisaged that a potential satellite operator may wish to have initial meetings or correspondence with the ACMA to determine the process or the depth of information

¹¹ API and CR/C are types of ITU publications in the International Frequency Information Circular (IFIC).

required. The ACMA may, at its discretion, engage in such meetings or correspondence. This may, however, be charged at the standard hourly rate.

Coordination with other Australian satellite systems

Under Article 44 of the ITU Constitution, in acting as the Australian administration in this area, the ACMA must bear in mind that radio frequencies, and any associated orbits, are limited natural resources which must be used rationally, efficiently and economically. The ACMA considers that Australian satellite systems which are technically incompatible do not fulfil this requirement and, acting as the filing administration for both systems, the ACMA will require any conflict to be resolved.

While the ITU Radio Regulations set out processes for coordination of satellite systems of different administrations which could potentially interfere with each other, they do not contain processes regarding the potential for interference between satellite systems of the same administration. Such intra-administration coordination is left to the administration.

The normal process of Australia-Australia coordination is as follows:

- > A complete application against the assessment criteria is submitted to the ACMA.
- > The ACMA may file the API (in cases where there will be both an API and CR/C), but will generally not submit the coordination (CR) data to the ITU until it has been demonstrated that necessary coordination agreements have been reached. In the event that substantial progress to achieve domestic coordination has been made, the ACMA may submit CR data to the ITU (if a favourable decision on the application has been reached) in order to give the applicant an earlier date of receipt. In this case, the ACMA would allow (as a condition of submission of CR data) a maximum of six months from submission of CR data to complete domestic coordination.
- > The date of receipt of a complete application to the ACMA establishes the responsibility to initiate coordination. An applicant who submits an application for a satellite system(s) which has potential incompatibility with the satellite system(s) of an existing operator who provided a complete application prior to the applicant is required to initiate coordination with the existing operator.
- > The ACMA may establish whether there is a potential for interference. This may be based on two factors—frequency overlap and, where applicable, the orbital separation of the satellite systems. However, it is the applicant's responsibility to provide its own assessment of potential domestic coordination requirements, and the applicant is required to initiate coordination with the operators of potentially affected Australian space services.
- > In cases where any part of a new satellite network has frequency overlap with an existing network, the potential for interference should be assessed in accordance with Table 1. It should be noted that, in certain cases, Table 1 may not be applicable and frequency overlap may be used as the sole criterion in determining the potential for interference.

Table 1 Categorisation of potential for interference between Australian satellite systems

Satellite frequency band	Geocentric orbital separation that is considered a potential for interference (degrees)
<1980 MHz	All cases
1980-2690 MHz	All cases
3400-7075 MHz	≤10
7.145-17.3 GHz	≤9
> 17.3 GHz	≤8

-
- > All Australian satellite operators have an obligation to use their best endeavours to reach coordination agreements in good faith, in a timely fashion. The ACMA will take account of the approach taken by parties in meeting this obligation in the event of a dispute.
 - > To the extent that there is a dispute, the ACMA may act as a decision-maker. If a satellite operator can demonstrate that continued efforts towards domestic frequency coordination are being stymied by circumstances outside of its control, it may request that the ACMA act as a decision-maker. If so requested, the ACMA may request information on the issue from all relevant parties. The ACMA may then investigate the issue and reach a decision as it sees fit. In reaching its decision, the ACMA may consider issues such as dates of receipt, coordination history, compliance with the procedures of this manual, maturity of satellite system(s), and other matters that it may consider to be in the public interest. The ACMA may revoke such a decision in the case of a signed agreement between both parties.
 - > The ACMA's policy is to not permit frequency assignments of a satellite system to be brought into use where domestic coordination with prior filed Australian satellite systems is outstanding. (Note: This policy only applies to the relevant frequency assignments for which coordination is outstanding, not the entire satellite system).

Procedures for managing the coordination and notification of satellite systems

Background

The role of the ACMA is to facilitate access to spectrum and orbital resources in a manner that is in accordance with Australia's international and domestic obligations. It is not the ACMA's role to provide advice on physical satellite or satellite system design. Decisions of a technical nature in the design and coordination of the satellite system have the potential to affect the viability of a project, and these decisions rest with the satellite operator. The ACMA may directly participate in coordination activities only if other avenues have been exhausted and not performing this work would be in derogation of Australia's international obligations.¹²

Member states of the ITU (such as Australia) are bound by the administrative regulations of the ITU. Included in the administrative regulations are the Radio Regulations. Article 11 of the Radio Regulations outlines the conditions for which international notification of a radiocommunications service is required—typically the potential for harmful interference to any service of another country. Article 9 of the Radio Regulations contains the requirements and process to obtain agreement with other administrations prior to the notification of a satellite system.

The ITU maintains a list of coordination agreements required of a satellite system. Coordination can only be requested or obtained at an administration level. In practice, coordination is often obtained at an operator-to-operator level. For this reason, *all* Australian satellite operators must make substantive coordination efforts in order to not deny the orbital/spectrum resource to other countries.

Harmful interference

The satellite operator must take all reasonable steps to ensure that harmful interference is not caused by the operation of its satellite system.

If the satellite operator receives a complaint that transmissions from its satellite system have caused, are causing, or are likely to cause harmful interference, the satellite operator must provide the ACMA with:

- > a copy of the complaint (as soon as possible), and
- > an engineering assessment of the nature and extent of the harmful interference alleged in the complaint.

Similarly, if the ACMA receives a complaint of harmful interference, it may bring it to the attention of the relevant satellite operator as soon as practicable.

Should the ACMA agree that there is a case of harmful interference that needs to be remedied, it may issue an instruction to the satellite operator. Such an instruction may require immediate removal of the potential for harmful interference, as deemed appropriate by the ACMA. This may be achieved through means such as:

- > cessation of transmission, if necessary

¹² The ACMA is under no obligation to act in the satellite operator's interests should such action need to be taken in order to meet Australia's international obligations.

- > variation of transponder radiofrequency power output
- > variation of occupied bandwidth
- > variation of assigned frequency
- > variation in station keeping or position
- > provision of information to the ACMA, the ITU or other administrations to resolve the issue.

Any instruction issued by the ACMA in relation to a claim of harmful interference will typically be designed in such a way as to cause the minimum amount of disruption to the satellite operator while adequately addressing the issue of harmful interference.

The ACMA may proceed to refer the matter to a conciliator, under Part 4.3 of the Radiocommunications Act. Following the conciliation process, the ACMA may issue a direction under section 212 of Part 4.3 of the Radiocommunications Act.

Ongoing obligations of the satellite operator

The satellite operator must, at all times, ensure the following conditions are met.

- > In the case of non-Government satellite operators, the satellite operator must at all times remain a company that is incorporated in Australia (under the *Corporations Act 2001*), carries on business in Australia and has management staff in Australia.
- > The satellite operator must maintain the ability to exercise operational control from within Australia. (This provision does not preclude the use of outsourced TT&C. The satellite operator, however, is still the party responsible for fulfilling this provision should such arrangements be made.)
- > The satellite operator must at all times comply with the ITU Radio Regulations, any relevant administrative regulations of the ITU and the ITU Rules of Procedure.
- > The satellite system must be operated in a manner which is in accordance with any applicable Australian legislation, including :
 - > the Radiocommunications Act
 - > the Telecommunications Act
 - > the Broadcasting Services Act
 - > the Space Activities Act.
- > The satellite operator should respect any applicable legislation of a country where services are being delivered to, or are originating from.
- > Any statement made to the ACMA, in relation to the satellite system, must be true and correct at the time it is made.
- > Permission must be obtained from the ACMA prior to bringing the satellite into use.
- > The satellite operator is responsible for all ITU and ACMA fees for its satellite systems.¹³
- > The satellite operator must promptly communicate to the ACMA any significant changes to the planned radiocommunications services from those presented in the original application to the ACMA. Significant detrimental changes to the Australian

¹³ See also section on 'Administrative provisions'.

benefit from the proposed radiocommunications services may result in the ACMA re-assessing whether to continue to support the satellite network/s.

International Frequency Information Circular (IFIC) process

Articles 9 and 11 of the ITU Radio Regulations detail processes for the international coordination and notification of satellite systems. In accordance with these Articles, the ITU publishes details of new and modified satellite systems in its fortnightly International Frequency Information Circular (IFIC). Each IFIC contains a number of individual publications of different types, as set out in the Radio Regulations (and other ITU documents). The ACMA is obliged to provide comments on many of these publications; such comments include providing or delaying agreement to a foreign satellite system in accordance with the provisions of Article 9 of the ITU Radio Regulations.

Foreign satellite systems published in an IFIC—potentially affected Australian satellite systems

Satellite operators must perform their own calculations to determine the likelihood of interference, and must arrange access to the information required to perform such assessments.

The satellite operator must provide written comments on each IFIC to the ACMA, detailing what coordination the ACMA should initiate. These comments must be received by the ACMA at least five weeks before the comments due date. These comments must clearly state:

- > the administration, foreign satellite systems, Australian satellite system(s), frequency bands, and relevant provisions for which coordination is requested, supported by
 - > justification for the request to engage in coordination, in accordance with the provisions of the Radio Regulations (in particular RR 9.52)
 - > where possible, a proposed method for resolving the issue.
- > A list of any coordination that, while flagged by the ITU (under RR 9.7), does not need to be performed, or has already been completed.

The decision to initiate coordination must be based on technical calculations demonstrating a potential for interference. These calculations must be made available to the ACMA upon request. The trigger value of six per cent for $\Delta T/T$ is a good indicator of the potential for interference in many cases, but a more thorough analysis (for example C/I calculations) can lead to a reduced amount of necessary coordination. The $\Delta T/T$ trigger threshold can be considered a *necessary* condition for the need for coordination, but should not be considered a *sufficient* condition to initiate coordination. Unnecessary coordination can place a burden on the ITU, both administrations, and both satellite operators. It also makes the process of achieving all required coordination agreements more complicated.

It should be noted that in many cases the ITU will apply a coordination arc as a tool for assessing the potential for interference. It is strongly suggested that in these cases, satellite operators rely on their own calculations rather than the coordination arc approach as the coordination arc as a tool may not identify all cases of potential interference. The coordination arc approach may also highlight cases where $\Delta T/T$ is less than six per cent—in this case the satellite operator is recommended to state that it does not want coordination initiated.

Requests by satellite operators to initiate coordination for satellite networks that are outside of the coordination arc will only be submitted by the ACMA to the ITU if accompanied by a summary of $\Delta T/T$ calculations showing an increase of at least six per cent.

In certain cases, such as an Australian satellite operator's satellite system using non-directional terminals or a NGSO constellation, frequency overlap with a foreign-published satellite system may be sufficient to initiate coordination.

Satellite operators are encouraged to perform sufficient calculations during this mandatory step so that the number of requests to enter coordination are minimised (while still providing sufficient protection to their satellite systems).

The ACMA will, in accordance with its domestic and international obligations, perform checks on all comments received from satellite operators in response to an IFIC publication for a foreign satellite system. If any inconsistencies are found, the ACMA may contact the operator and attempt to resolve any inconsistency identified. In the absence of advice from the satellite operator, regarding potentially affected Australian networks for which it is responsible, at least five weeks prior to the comments due date, the ACMA will retain its discretion in responding to the foreign administration, but will generally do the following:

- > Regarding comments made under provisions of the ITU Radio Regulations which specify a mandatory response, the ACMA will provide agreement to the foreign administration whose network(s) have been identified as potentially affecting the satellite network(s) which falls under the responsibility of the non-responding operator.
- > Regarding comments made under provisions of the ITU Radio Regulations which do not specify a mandatory response, the ACMA will provide no response to the foreign administration whose network(s) have been identified as potentially affecting the satellite network(s) which falls under the responsibility of the non-responding operator.

IFIC responses to foreign administrations

The ACMA collates the satellite operator responses, and, subject to the procedures given in the previous section, sends these responses in accordance with the current procedures of the ITU. The satellite operator will receive a copy of the collated responses.

Australian satellite systems published in an IFIC

Foreign administrations will comment on Australian satellite systems published in 'special sections' of an IFIC. The ACMA will wait until after the comments period has expired and forward copies of these documents to the satellite operator. The ACMA will manage the ITU requirements for the publication of CR/D documents, which summarise all non-mandatory comments received in response to the original CR/C publication. To this end, the satellite operator must forward to the ACMA any correspondence that it receives in response to publications of its satellite systems in an IFIC.

Experiences of this process show that a number of comments made by foreign administrations will be vague or ambiguous, and that some comments are made erroneously. Unless otherwise agreed, the ACMA will liaise with the foreign administration to provide sufficient information (particularly with regards to non-responding administrations flagged under RR 9.7) so that a list of the following can be developed:

- > the administration concerned

- > relevant provisions for which coordination is requested
- > justification for entering coordination (for example a summary of $\Delta T/T$ calculations)
- > foreign satellite system(s)
- > Australian satellite system(s)
- > the validity of the foreign request (whether a provision of the Radio Regulations is 'triggered').

Requests from other administrations

As part of the international coordination process, Australia is often required to respond to requests for information. These requests may come directly from a foreign administration (or satellite operator) or from the ITU. For example, under RR 9.60, an administration may 'request the assistance of the Bureau' (the Radiocommunications Bureau (BR), a section of the ITU). Australia is usually obliged to respond to the requests in a substantive and timely manner.

Satellite operators are required to assist the ACMA fulfil this obligation to respond to these requests by providing thorough, substantive responses in a timely manner. Failure to respond in a timely manner or failure to provide sufficient technical detail may result in the ACMA providing a response on behalf of a satellite operator, as the ACMA sees fit at the time (which may not be in the best interests of the satellite operator).

Satellite operators are also required to avoid, as much as possible, the need for other administrations to request the assistance of the BR.

Multiple instances of failing to respond to requests under RR 9.60, or multiple cases of requests under RR 9.60 that are considered to have been avoidable, may result in the ACMA taking action as described in the 'Enforcement' section of this Manual.

Additional services that the satellite operator can request from the ACMA

The satellite operator may request that the ACMA assists in issues relating to their satellite system, for example, assessing the potential for interference in a given scenario. The ACMA has the sole discretion in determining whether to accept such a request.

Ongoing management of satellite systems through milestones

The need for milestones

All member states of the ITU are bound by the Constitution and Convention of the ITU. The Constitution of the ITU, Article 44, paragraph 2 states that member states be mindful that:

... radio frequencies and any associated orbits, including the geostationary-satellite orbit, are limited natural resources and that they must be used rationally, efficiently and economically, in conformity with the provisions of the Radio Regulations, so that countries or groups of countries may have equitable access to those orbits and frequencies ...

Further, Paragraph 1 states:

Member states shall endeavour to limit the number of frequencies and the spectrum used to the minimum essential to provide in a satisfactory manner the necessary services.

The ACMA also notes the problem associated with satellite systems that never result in the provision of actual services—the so called ‘paper satellite’ problem. The ACMA considers the number of Australian satellite systems that have passed their regulatory time limits with little or no coordination achieved to be unacceptable.

The milestones process has been designed to manage Australia’s obligations under the ITU Constitution and Convention, while maintaining sufficient flexibility to allow for the uncertainties in international satellite coordination. Progress towards providing actual services must be demonstrated, through meeting a series of milestones, or the satellite system may be suppressed prior to the ITU regulatory dates.

Milestones and associated dates

The following schedule of milestones may be applied to new satellite systems filed with the ITU through Australia. Note that the time limit is determined from the original date of receipt (at the ITU) of advance publication information.

Table 2 Milestones

Milestone	Completion date ¹⁴
> Initial contact with administrations for which coordination is required > Analysis of the potential for harmful interference and future coordination strategy	One year
> Analysis of the potential for harmful interference and future coordination strategy	Two years
> Analysis of the potential for harmful interference and future coordination strategy	Three years
> Launch contract signing, in the case of a service to be provided by a newly launched satellite > Satellite contract signing, in the case of a service to be provided by a newly launched satellite > Notice of intent to relocate an existing satellite, in the case of a service to be provided by a satellite already in operation at another location > Resolution 49 data submitted to ITU > Analysis of the potential for harmful interference and future coordination strategy	Four years
> Analysis of the potential for harmful interference and future coordination strategy	Five years
> Analysis of the potential for harmful interference and future coordination strategy	Six years (seven years for planned bands)

¹⁴ Time limit is determined from the original date of receipt (at the ITU) of Advance Publication Information.

> Satellite launch, in the case of a service to be provided by a newly launched satellite > System operational in accordance with the parameters of the ITU satellite network > Initial notification data submitted > Relevant radiocommunications licences obtained > Analysis of the potential for harmful interference and future coordination strategy	Seven years (eight years for planned bands)
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Information to be provided by satellite operators regarding the potential for harmful interference and future coordination strategy

The information must contain at a minimum:

- > coordination summary
 - > administrations
 - > satellite systems (from year two on)
 - > provisions of the Radio Regulations under which coordination is required
- > coordination strategy
 - > how coordination will be prioritised
 - > any administration or operator meetings planned
- > summary of coordination activities
 - > must show substantive efforts for coordination (i.e. meetings, exchanges of correspondence offering proposed solutions, etc)
 - > efforts must be proactive, substantive and ongoing
- > summary of coordination resulting from coordination request (IFIC) responses made to other administrations
 - > progress on this coordination
 - > must show substantive efforts for coordination (i.e. meetings, exchanges of correspondence offering proposed solutions, etc)
 - > efforts must be proactive, substantive and ongoing.

Milestone compliance

The satellite operator is responsible for demonstrating—to the satisfaction of the ACMA—the completion of each of the milestones in Table 2 before the date set out next to that milestone. In this regard, the satellite operator is encouraged to liaise with the ACMA well before the due date of the milestone to ensure that the milestone is regarded as satisfactorily complete.

Amendment of a milestone

The satellite operator may request that the completion date of a milestone be amended citing unforeseen circumstances. The ACMA may grant such a request if such a request is received before the completion date, and if it considers the circumstances warrant such an amendment.

Failure to meet a milestone

Should the ACMA not be satisfied that a milestone has been completed, it may inform the satellite operator, giving reasons for its assessment.

The satellite operator must promptly respond to any notice of non-compliance. This response must contain:

- > detailed reasons and supporting evidence as to why the satellite operator believes that the milestone was met (if applicable), or
- > a detailed plan for how to address the non-compliance.

Notification

Prior to the regulatory deadline of the ITU (seven years from receipt of the API data in most cases), the ITU requires that:

- > Resolution 49 (due diligence) data be submitted to the ITU
- > the satellite system be 'brought into use', with confirmation of this submitted to the ITU
- > initial notification data be submitted to the ITU (noting that the process to successfully notify a satellite system is long).

Failure to meet any of these three requirements within the timeframe will result in the ITU suppressing the satellite system. This is outside of the control of the ACMA.

Resolution 49 data

The Resolution 49 data is required to be submitted to the ACMA (as a milestone) well before the ITU requirement for this data (the regulatory period of the satellite system). It is worth noting the ITU requirement under Resolution 49 that this data be submitted 'as early as possible'. Resolution 49 requires specific information relating to contractual arrangements regarding spacecraft manufacture and launch. The purpose of the Resolution 49 data is to provide '... administrative due diligence ...' for '... addressing the problem of reservation of orbit and spectrum capacity without actual use'. This purpose is best served by administrations both vetting the contents of the data and insisting on its early submission to the ITU.

The ACMA requires written confirmation of signing of the launch and manufacture contracts (rather than viewing the contracts)¹⁵. Written confirmation of these contracts must contain the information required for Resolution 49, and be provided by *both* the satellite operator and the launch provider or manufacturer. In the case of a service to be provided by a satellite already in operation at another location, a notice of intent to relocate an existing satellite must be given, in addition to Resolution 49 data.

Confirmation of bringing into use

Confirmation of bringing into use must be submitted prior to the regulatory period (seven years from receipt of the API submission in most cases). This information should be submitted to the ACMA in advance of this deadline, along with a description of what parts of the satellite system have been or will be brought into use.

¹⁵ The ACMA recognises the confidentiality sensitivities of contracts that are made for satellite launch and manufacture.

Initial notification data

Notification data should be submitted to the ACMA in a manner which is suitable for submission to the ITU, in advance of the regulatory dates. The ACMA will perform some checks on this data, but it is the responsibility of the satellite operator to ensure the accuracy of this data.

The ACMA will submit this data to the ITU, or further liaise with the satellite operator (if required), to enable the data to be submitted.

Suspension of services

To allow the ACMA to comply with provisions of the Radio Regulations, satellite operators are required to inform the ACMA of the suspension of assignments for which notification data has been submitted to the ITU.

Application of RR 11.32A and 11.33

Examination is required of frequency assignments of notices with respect to the probability of harmful interference. Provision 11.32A of the ITU Radio Regulations contains the text “for those cases for which the notifying administration states that the procedure for coordination ... could not be successfully completed”. Provision 11.33 contains very similar text. Since the ITU specifies that this provision is for instances of required coordination which *could not* be obtained (e.g. the required coordination could not be obtained because the operator, despite its best efforts, could not complete all required coordination prior to the expiry date of the network), the ACMA may only request that the ITU apply these provisions if a satellite operator can demonstrate substantive efforts were made towards obtaining required coordination.

Satellite operators are encouraged to liaise with the ACMA when experiencing trouble coordinating with other satellite operators. If needed, the ACMA (acting as the Australian administration) can represent the satellite operator, particularly in administration to administration correspondence. If needed, the ACMA may ‘request the assistance of the Bureau’ on behalf of a satellite operator (provided that the ACMA is convinced that sufficient attempts to resolve the issue have been made).

Permission to bring into use

The satellite operator must ensure that permission to bring into use has been granted by the ACMA prior to the satellite system being brought into use (including use for testing purposes only). Such permission may be requested for specific parts of the satellite system. For example, permission may be sought for a subset of frequencies or for a specific beam. The ACMA may not grant permission unless permission is specifically requested and the operation of the satellite system is covered by relevant licences.

This provision will not prevent the use of parts of the satellite system in an emergency. The ACMA must be informed of an emergency as soon as practicable, with details of the nature of the emergency.

Satellite operator may conduct coordination directly

In order to satisfy ITU coordination requirements, an administration responsible for a satellite system must achieve coordination with other administrations. The ACMA, however, believes that satellite operators are best placed to perform the technical coordination of frequency assignments for their satellite systems.

The ACMA encourages satellite operators to engage in operator to operator coordination on the condition that:

- > the coordination is performed on a purely technical basis
- > the satellite operator does not engage in coordination discussions for Australian satellite systems or radiocommunication services for which they do not have access.

The ACMA may attend a coordination meeting:

- > at the request of the satellite operator;
- > at the request of the satellite operator or administration of another country
- > because it believes attendance to be in Australia's interests.

The ACMA may decide in its discretion whether to attend. If the ACMA decides to attend a meeting following a request to do so, it will do so at the expense of the satellite operator.

Efforts to achieve coordination agreements

A satellite operator is responsible for effecting coordination between its satellite systems and those of other administrations. The ACMA prefers coordination work to occur at an operator to operator level.¹⁶ The satellite operator is best placed to determine any compromises to the satellite system that can be made. A coordination agreement should be formalised by the satellite operator and the other party. The agreement then needs to be forwarded to the ACMA.

Any agreement at an operator level must be endorsed by the ACMA (acting as the Australian administration) and by the foreign administration. Prior to endorsing the agreement, the ACMA will check that the terms of the agreement are limited to the satellite system of the satellite operator, and are in accordance with Australian obligations—such as the ITU rules, Australian law, spectrum management principles, etc. The ACMA will then send a copy of the endorsed agreement to the foreign administration requesting their endorsement (and send a notice that agreement has been reached to the ITU).

The administration or satellite operator is obliged to pursue coordination required for their satellite system (often incorrectly referred to as 'ahead in the queue') as well as any relevant coordination required for foreign satellite systems (often incorrectly referred to as 'behind in the queue').^{17 18} This requirement is due to the fact that, obviously, bilateral coordination only works if parties are prepared to make efforts in both situations. Further to this, the ITU Rules of Procedure—which provide information on how to interpret the Radio Regulations—confirm this.

Once coordination has been initiated in response to an IFIC publication, a satellite operator must make reasonable efforts towards completing this coordination in a timely manner. The ACMA, acting as the Australian administration, will not condone efforts to deliberately ignore or delay coordination work solely because it is inconvenient to perform this work.

However, the manner in which coordination will be performed (for example, through operator level meetings, through correspondence, etc) is for the satellite operator to determine.

¹⁶ Recognising that involvement of the ACMA may be required—for example, at the insistence of a foreign administration.

¹⁷ ITU Rules of Procedure (Part A1, Article 9, Section 9.6).

¹⁸ Radio Regulations 9.53: '... the requesting and responding Administrations shall make every possible mutual effort to overcome the difficulties ...'

Enforcement

The preference of the ACMA is to resolve issues in an informal way with the satellite operator. The ACMA has a history of resolving the vast majority of issues in this manner. However, the ACMA has a range of other approaches available to it, as outlined in this section.

The ACMA performing its role as the administration and supporting a satellite system is contingent on satellite operators conforming to this manual.

In the event that an operator does not conform to this manual, then the ACMA will take actions to remedy the defect using, as appropriate, whatever powers are available to it.

The ACMA may, for example, stop performing satellite coordination work on behalf of a satellite operator. However, the ACMA is unlikely to stop performing its role without first having provided the satellite operator with at least one written warning.

A number of matters are considered sufficiently critical to warrant possible further enforcement action. For these matters, it may not be sufficient for the ACMA to simply stop providing satellite coordination services, and still satisfy its obligations. These are 'assessment criteria', 'ongoing obligations', 'coordination', 'milestones' and 'harmful interference'.

In the event of non-compliance with this manual of procedures, the ACMA may issue an instruction to the satellite operator, giving specific reasons as to why it believes that there is non-compliance. The satellite operator must promptly reply to such an instruction, addressing each issue raised by the ACMA and detailing how it will remedy any non-compliance.

Should the satellite operator not adequately address and remedy the non-compliance, the ACMA may decide to cancel a satellite operator's access to a satellite system. It may then instruct the ITU to suppress (permanently delete) the satellite system, or re-issue access to the filings for the satellite system to another satellite operator if it decides that doing so is in the best interests of Australia. In the case of non-compliance with this manual, the ACMA has sole discretion in determining whether access to a satellite system should be re-issued, or whether the ACMA will request that the ITU suppress the satellite system.

In the case of non-compliance with this manual, cost recovery charges may apply for the following items:

- > assessment of non-compliance
- > assessment of whether to re-issue access to the filings for the satellite system to another satellite operator (if applicable)
- > any necessary communication with the ITU or foreign administrations regarding the satellite system (should the system be suppressed).

As appropriate, the ACMA may also take account of the approach by a satellite operator towards its filing related obligations when considering other actions.

Transfer of satellite systems¹⁹

Use of an access to an ITU satellite system

Any information related to a satellite system submitted to the ITU by the ACMA, (acting as the administration of Australia) will remain the responsibility of the ACMA (for the Commonwealth of Australia), on the basis that only administrations of member states can submit, modify or suppress information related to satellite systems. Through submission of such information to the ITU, in practice the ACMA obtains an “access” to deal with ITU published information associated with the satellite system and, if brought into use, the radio frequencies and orbit for the satellite system.

A satellite system includes a satellite network, and in practice consists of a set of technical parameters described and submitted to the ITU. The ACMA may provide for exclusive use of an access for an Australian satellite system to a satellite operator. To the extent permitted under Australian law and in accordance with Australia’s obligations, this authorises the satellite operator to:

- > design the technical parameters of the satellite system as it sees fit
- > engage in coordination agreements in relation to the satellite system as it sees fit
- > tender for the manufacture and launch of a physical satellite that is in accordance with the parameters of the satellite system
- > operate a physical satellite in accordance with the parameters of the satellite system (including any coordination agreements), and the procedures of the manual.

The ACMA does not consider information or parameters related to satellite systems submitted to the ITU to be an asset to be traded. A satellite operator wanting to use an access to filings used by another satellite operator (with the agreement of the latter satellite operator, and their associated relinquishment of the use) must submit an application against the assessment criteria to the ACMA, and follow other relevant procedures as set out in this manual. The ACMA considers the coordination of satellite systems as a tool to facilitate international sharing of spectrum.

Satellite systems relinquished by operator request

Satellite operators are encouraged to inform the ACMA as soon as any satellite system becomes unnecessary to their requirements or if it becomes obvious that a satellite system is highly unlikely to be successfully coordinated or brought into use.

¹⁹ The provisions of this part of the manual apply to the information submitted to the ITU (the satellite system, or ‘filing’ as it is sometimes informally referred to as) and not to physical satellites, and the entities that own them, which may be tradeable assets. The ACMA procedures set out here are not intended to impact on the transfer of such tradeable assets.

Administrative provisions

Australian space objects

For the purposes of the Radiocommunications Act, any implementation of a satellite system (i.e. physical satellites) for which Australia is the responsible administration shall be considered to be an Australian space object.

Fees

Assessment of applications for new satellite systems

The ACMA charges an upfront amount which, from 1 July 2012, will be outlined in the *Radiocommunications (Charges) Determination 2012*.

Cost recovery for work performed by the ACMA

The ACMA recovers its costs of for work undertaken on the satellite operator's behalf on an hourly basis. The amount charged per hour is set out in the *Radiocommunications (Charges) Determination 2007* and its revisions. The ACMA will raise invoices every quarter. Payment terms will be the ACMA's standard payment terms set out in the invoice. Failure to comply with the payment terms of the ACMA for two consecutive quarters (or for three non-consecutive quarters) may result in the ACMA ceasing to provide its services or taking other action.

ITU cost recovery

Prior to submitting data to the ITU that will attract an ITU fee, the ACMA will raise an invoice for an estimate of the fees in Australian dollars. This estimate will include an amount to cover currency fluctuations.²⁰ This money will be held in trust by the ACMA until the payment is made. After the payment is made, the satellite operator will be credited the difference between the actual fee and the amount held in trust if it is greater, and charged for the difference if it is less.

Submission of applications

Applications can be submitted to the ACMA via email, to the following email address: satellite.coordination@acma.gov.au.

The following address should be used for any notices submitted by letter to the ACMA:

The Manager
Spectrum Engineering Section
Spectrum Infrastructure Branch
Australian Communications and Media Authority
Purple Building, Benjamin Offices
Chan Street
Belconnen ACT 2617

Confidentiality

Information that can be obtained from public sources, such as the ITU website, or by purchasing the IFIC CDs, will not be treated as confidential. Information that is required to be communicated between administrations and satellite operators for the purpose of effecting satellite coordination will not be considered confidential. Generally other information regarding a satellite system, provided by a satellite operator will be

²⁰ The ACMA cannot process a payment for a greater amount than it currently holds in trust for the payment.

treated as 'commercial in-confidence' by the ACMA, unless otherwise agreed between the parties or required to be disclosed.

Commencement of this manual of procedures

Applications for satellite systems received prior to commencement of this manual will not be subject to this manual of procedures, other than through written agreement between the ACMA and the satellite operator.

Satellite systems operating under existing Deeds of Agreement will not be subject to this manual of procedures, unless otherwise agreed to in writing between the ACMA and the satellite operator.

The date of commencement of this manual is 1 January 2012.

Changes to this manual of procedures

Changes to this manual may occur in response to changes in the ITU Radio Regulations, or because part of this manual is not working effectively. Changes to this manual will be provided to satellite operators who have filed satellite systems in accordance with it. The most recent version of this manual will be available at the ACMA website at www.acma.gov.au.

Glossary

BSS

Broadcasting Satellite Service. This term has the same meaning in this manual as it has in the ITU Radio Regulations.

constellation

A collection of more than one NGSO Satellites.

FSS

Fixed Satellite Service. This term has the same meaning in this manual as it has in the ITU Radio Regulations.

geosynchronous

An orbital period equal to the time taken for one complete rotation of the Earth.

geostationary

A geosynchronous, circular orbit that lies in the equatorial plane and which remains fixed relative to the Earth. The ITU Radio Regulations have extended this definition to an inclination of within 15 degrees of the equatorial plane.

GSO

Geostationary Satellite Orbit.

NGSO

Non-Geostationary Satellite Orbit.

operational control

The ability to control any aspect of the physical satellite and its radio emissions.

physical satellite

The physical space object which is used to host one or more satellite networks/satellite system.

planned bands

The frequency ranges as described in the ITU Radio Regulations Appendices 30, 30A and 30B. These bands have been formally planned to allow each country to have an equitable allocation for Broadcasting Satellite Services and Fixed Satellite Services.

satellite network

This term has the same meaning in this manual as it has in the ITU Radio Regulations (section 1.112). It describes the physical parameters of a network of radiocommunications links (including Earth station parameters).

satellite system

This term has the same meaning in this manual that it has in the ITU Radio Regulations (section 1.111). It is very similar to satellite network; the main difference is that a satellite system can describe a system with more than one physical satellite. The term satellite system has been used in many places in this manual in order to include NGSO satellite systems as well as GSO satellite networks.

satellite operator

The satellite operator is the party responsible for designing, funding and operating the satellite system. (i.e. the party that applies to the ACMA).