

Review of the Space Activities Act 1998

Issues Paper

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This Issues Paper provides background information relevant to the Australian Government’s current review of the *Space Activities Act 1998* (announced by the Minister for Industry, Innovation and Science, the Hon Christopher Pyne MP on 24 October 2015); sets out the policy rationale for the review; and provides a context for the specific issues that the review is seeking to address.

The public submission process is being conducted from 24 February to 30 April 2016. The process will enable stakeholders to provide input on matters related to the terms of reference.

The review is being conducted by the Department of Industry, Innovation and Science, with the assistance of international space law expert, Professor Steven Freeland. More information is available at www.industry.gov.au/spacereview.

Context

What is the Space Activities Act 1998?

The *Space Activities Act 1998* (Act) and *Space Activities Regulations 2001* (Regulations), and the *Space Activities (Scientific or Educational Organisations) Guidelines 2015* create a regulatory framework for civilian space activities in Australia, as well as for those conducted overseas but involving Australian interests. The Act and Regulations deal primarily with the launching of space objects and the return to Australia of space objects. The stated objects of the Act (as currently drafted) are to:

- (a) establish a system for the regulation of space activities carried on either from Australia or by Australian nationals outside Australia; and
- (b) provide for the payment of adequate compensation for damage caused to persons or property as a result of space activities regulated by this Act; and
- (c) implement certain of Australia's obligations under the United Nations Space Treaties; and
- (d) implement certain of Australia's obligations under specified space cooperation agreements.

Why the Act was established

In drafting the Act, the then Government identified two key imperatives for reform in this area - commercial and legal.

Commercial imperative

In the 1990s, Australia had no commercial space launch industry; however several private sector groups were proposing to build and operate commercial rocket launch facilities in Australia, with an expectation that at least one of these projects was likely to proceed in the near future.

The lack of a legislative or regulatory framework to oversee relevant licensing, safety and liability issues associated with such activities was viewed as a deterrent to attracting the investment needed for commercial success. By instituting a comprehensive regulatory framework, the Government aimed to attract investment by commercial interests, while ensuring that Australia's national interests were properly safeguarded and that its international obligations were being appropriately met.

Legal imperative

Australia is a State party to the five principal United Nations (UN) space treaties, which include provisions that place direct responsibility on Australia for its national space activities and unlimited liability on the Australian Government for damage caused to other countries and their nationals by space objects (privately or publicly owned) either launched from Australia or by Australians overseas. The three UN treaties of most significance for Australia are:

1. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies (1967)

Known as the 'Outer Space Treaty', this agreement specifies the basic legal framework of international space law. Among other things, it limits the use of the Moon and other celestial bodies (and, by extension, all of outer space) to peaceful purposes and states that the exploration and use of outer space shall be done for the benefit and in the interests of all countries, and that such activities shall be free for all States.

2. Convention on International Liability for Damage Caused by Space Objects (1972)

Known as the 'Liability Convention', this treaty imposes international liability on State parties in certain circumstances for damage caused to persons or property of other States, or to their space objects, by space objects launched by a State party from its territory/facility or elsewhere, or whose launch was procured by it, either through its agencies or non-governmental entities.

3. Convention on Registration of Objects Launched into Outer Space (1974)

Known as the 'Registration Convention', this treaty requires States to provide specific details to the UN about every space object it launches into Earth orbit or beyond.

The two other principal UN treaties that have less direct relevance to the Act, but also bind Australia, are:

4. Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (1968)

Known as the 'Rescue Agreement', this treaty requires that any State party that becomes aware that the personnel of a spacecraft are in distress must provide all possible assistance and notify the launching authority and the Secretary General of the UN.

5. Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (1979)

Known as the 'Moon Agreement', this treaty specifies a framework whereby a future international regime might be established to govern the exploitation of the natural resources of the Moon and other celestial bodies as such exploitation is about to become feasible.

Why the Government is reviewing the Act

Technological advancements

Space technologies have progressed significantly since the Act was legislated in 1998. The assumption at the time of drafting was that Australia would develop a large commercial launch industry in a period when launching activities were largely undertaken by States.

For a variety of reasons, the anticipated commercial launch industry has not eventuated. Since that time, the environment has been shifting from a total reliance on public money to support space launches, to a growing interest from private investors who recognise the potential for commercial returns from space activities.

To date, the Act has not been used for one of its original primary purposes, namely to establish a commercial launch facility on Australian soil. Rather, the majority of activity under the Act has involved the issue of overseas launch certificates to providers of commercial telecommunications satellite services. In addition, the overseas launch certificate process is of increasing relevance to Australian research institutions and small operators with payloads on foreign launch vehicles.

Emerging technologies, in particular the advent of small satellites has opened the space market to small enterprises and research institutions and has stimulated an influx of activity worldwide. The Australian Government has recognised the importance of ensuring that Australian entities are in a position to take advantage of new commercial opportunities and that our civil space regulation is not inhibiting innovation and investment in this area.

More broadly, Australia is undergoing significant structural change in its industrial landscape. The end of automotive production and the general decline in traditional manufacturing in Australia is driving change from a structure characterised by lower value-added activities to an advanced economy that cultivates and commercialises innovative technologies. There is significant potential for space technologies to play a role in facilitating this transition where the regulatory environment is appropriately conducive to private investment in the space sector.

Global responsibilities

Appropriate regulation must balance opportunities with responsibilities, and the review of the Act must carefully consider Australia's accountability as a global citizen. Australia's obligations under the five principal UN space treaties involve specific requirements and responsibilities; however since the last of these treaties was negotiated in the late 1970s, the UN and the global space community has moved away from binding treaties towards so-called 'soft-law' mechanisms, such as codes of conduct, with varying degrees of success.

Issues such as the peaceful use of outer space, equity of access to desirable orbits, off-Earth mining rights and the responsible management of the space environment are potentially contentious, and the rules of engagement are at times susceptible to differing interpretations. Each space-faring nation must consider how its domestic regulatory framework should best address these issues, without disadvantaging its citizens in an environment which is globally competitive and involves increasingly high stakes.

The purpose of this Issues Paper

This Issues Paper sets out a number of considerations that seek to focus stakeholders' thinking on the main issues to be addressed as part of the review process, namely:

- The effectiveness of the Act (as currently drafted) in supporting innovation in space technologies
- Whether the investment environment is appropriate to supporting commercial activities in space
- What responsibilities the Australian Government should have in relation to managing space activities
- Identifying the key emerging issues that need to be addressed in Australian civil space
- How the Act (as currently drafted) aligns with other domestic and international legislation.

The questions set out in the boxes against each of the review's terms of reference provide a consistent structure that ensures stakeholder input addresses the scope of the review. There is opportunity for participants to provide additional comments on matters that fall outside these parameters (in *Section 6 – Other comments*).

Why your input is important

The space regulatory framework is complex and space-related regulation must consider many diverse and often conflicting issues. The Government believes that a broad range of views must be considered in order to get the balance right, in view of contemporary and possible future technological advancement, and to ensure that Australians are able to operate responsibly as part of those significant global value chains that utilise space and/or space-derived data.

Your submission is important to us as an input to the review deliberations. Once all submissions are received, the department, in consultation with its advisor, will analyse the information to inform advice to Government.

Written submissions can be lodged during the period 24 February 2016 to 30 April 2016 at www.industry.gov.au/spacereview.

Discussion of issues

Accessing space often involves a disparate range of issues. In undertaking this review, the Government wants to capture the diverse views of stakeholders, but needs to ensure that input has relevance to the matter being considered.

The development of current and future Australian space capabilities - balanced against Australia's international responsibilities - remains the underpinning purpose of the Act. The terms of reference of the review (TOR) seek both to discuss this from a broad range of perspectives and gather input from divergent stakeholder groups.

TOR 1. Support for innovation and the advancement of space technologies

The ability to innovate and to then subsequently commercialise these innovations are crucial determinants of global competitiveness. It is important for government policies to support innovation by reforming and updating regulatory frameworks that affect innovative activity. It is the application of technology advances, in conjunction with entrepreneurship, which translate innovations into productive economic activity and growth. However, this can only apply if market structures and the regulatory environment are conducive to expansion.

The Australian Government is committed to providing an environment where innovation can thrive. On 7 December 2015, the Prime Minister, the Hon Malcolm Turnbull MP, and the Minister for Industry, Innovation and Science, the Hon Christopher Pyne MP, released the National Innovation and Science Agenda (the Agenda) (link to [media release](#)).

The Agenda is a comprehensive plan to ensure that Australia grasps the opportunities created by technological disruption. It addresses issues such as encouraging Australian businesses to take risks around the development of smart ideas and improving access to funding during the early stage start-up phase for new businesses (www.innovation.gov.au).

The Agenda will support innovative Australian firms in all sectors, including civil space.

The Australian Government is also working with the States and Territories through the Council of Australian Governments (COAG) Industry and Skills Council to develop a better understanding of the suite of space activities that are currently in place across Australia, as well as the collective contribution of those activities to Australia's economy.

Recent advancements in space technologies, such as the introduction of small satellites and reusable launch systems, have significant potential to be catalysts that disrupt and redirect activities across the global economy.

TOR 1 QUESTIONS

TOR 1.1 Please rate your agreement to the following statements:

Strongly disagree; Disagree; Neither agree nor disagree; Agree; Strongly agree; No comment

- *The Government recognises space technologies as being an important contributor to Australia's innovative future.*
- *The public recognises space technologies as being an important contributor to Australia's innovative future.*
- *The Australian space industry recognises space technologies as being an important contributor to Australia's innovative future.*

TOR 1.2 How can space technologies contribute to Australia's innovative future?

TOR 1.3 Provide an example of where Australia's existing space-related regulation has impacted upon the pursuit of an innovative idea.

TOR 2. Entrepreneurship, investment and participation in global markets

Space activities have historically been the principal domain of governments, large commercial entities and/or academia, with space exploration and science typically representing the public face of such activities. Most space-faring nations are undergoing an ongoing translation from public and scientific activities to commercial endeavours; often this stems from an initial investment in space research. However, in reality, the transfer of investment from the public to the private sector presents a number of material challenges that include:

- **Regulatory hurdles:** Entrepreneurship and commercial success require an environment that is favourable to the creation and growth of new businesses. Barriers to entrepreneurship need to be properly identified and understood. In a global sense, regulatory hurdles affecting satellite launches have often been minimised to enable a viable commercial satellite industry to emerge; however the anticipated growth in activity driven by an increase in small satellites, coupled with the growing number of space-active States, may see a tightening of environmental regulation, in order to protect the space environment.
- **Accessing global supply chains:** According to the OECD, the global space economy generated over \$US250 billion in revenue in 2013. OECD research has shown that global value chains, as well as product and service supply chains for space systems, are internationalising at a rapid pace and are having an impact right across the space economy – from research and design to

manufacturing and services.¹ While the Australian Government recognises the potential for space technologies to contribute to Australia's international competitiveness, this is clearly an emerging sector without well-established competitive strengths in the Australian economy. Enabling further access by Australian firms to global supply chains is important and requires the right environment, in order to facilitate rapid responses to market demands and to attract private investment.

- **Financing:** The risk profile for space activities is typically high in comparison to alternative high tech investments. The scale of investment is often large, and certain technologies may be innovative and untried, thereby increasing the risk profile. Profits tend to be relatively low in the short term, with high initial capital costs, making it difficult to attract venture capital. Additionally, there appears to be a lack of understanding in the general community about the nature of space activities, with many still viewing it as being science fiction and/or the business solely of government, rather than a commercial opportunity that is worth investing in.
- **Skills:** Space start-ups are often established by individuals with both a passion and enthusiasm for space, and the technical expertise needed to develop space-related products, but with comparatively low levels of experience or expertise in business. This presents many challenges for the establishment of viable business models. The ability for start-up entrepreneurs to focus on business development (i.e. working *on* the business, not *in* the business) is further impacted by the need to source employees with specialist skills, who may also be in high demand in related sectors. While many of the new National Innovation and Science Agenda measures will support the civil space sector, more targeted measures may also be required.

TOR 2 QUESTIONS

TOR 2.1 Please rate your agreement to the following statements:

Strongly disagree; Disagree; Neither agree nor disagree; Agree; Strongly agree; No comment

- *Space regulation provides investment certainty for space-related business activities.*
- *Space regulation should be limited to ensuring the responsible use of space by Australians.*
- *Space regulation should include proactive elements that may help facilitate entrepreneurship and private investment.*

TOR 2.2 Provide an example of where Australia's space regulation has limited your capacity or inclination to invest in commercial space activities.

TOR 2.3 How could Australia's civil space regulation proactively facilitate entrepreneurship and private investment?

¹Space Economy at a Glance, 2014, OECD, p. 90

TOR 3. Commonwealth responsibility for national space activities and liability for damage caused by space objects

Under international law, Australia has, in certain circumstances, unlimited liability for damage caused by an Australian space object. This liability is shared by all Australians and, should there be a claim for damages, the cost would ultimately be met by Australian taxpayers.

The Government must determine whether there is a tangible net benefit for the population in offsetting this risk by transferring some responsibility to the entity undertaking a space activity. This is to be balanced against the extent to which there is a benefit to the whole Australian community in underwriting the risk to support an economically or socially valuable sector.

In developing the Act in the late 1990s, the then Government determined that the best net outcome was to share the financial risk associated with its liability by requiring that private launching entities indemnify, or demonstrate sufficient 'financial responsibility' to the Australian Government for the first \$AUD750 million or maximum probable loss in the circumstances (whichever is the lower figure). This requirement applies only for the first 30 days from the date of launch.

The relationship between economic risk and benefit is complex, and different countries have addressed this issue in different ways, in order to accommodate their unique national circumstances. For example, motivated by a desire to establish a leading role in commercial space activities, the French Government currently indemnifies its commercial launch provider, Arianespace, against any third-party claims for damages above Ariane's required insurance level of €60 million.

The decision by the French Government is relevant to French circumstances. The Australian space-related environment offers different constraints and opportunities, and an important component of this review is to determine the most appropriate regulatory response for Australian conditions.

Overall, in relative terms, Australia currently has a less active space industry than many other countries and it could be argued that a reduction in indemnity and insurance regulatory requirements would help facilitate growth in the sector. Conversely, it could also be argued that the relatively modest capacity of Australia's space industry means that the assumption of a larger financial risk may represent a poor use of taxpayer resources. To make this judgement, the Government must gather evidence of the tangible net benefit to the Australian economy.

TOR 3 QUESTIONS

TOR 3.1 Please rate your agreement to the following statements:

Strongly disagree; Disagree; Neither agree nor disagree; Agree; Strongly agree; No comment

- *The Government has a responsibility to protect taxpayers' money against liability generated by private space-related activities.*
- *It is appropriate for public monies to be used to underwrite private sector risk for space activities*

TOR 3.2 What contribution can space technologies make to Australia's overall economic prosperity?

TOR 3.3 What might be the net benefit to the Australian population of the Government taking a greater share of the financial risk arising from space activities?

TOR 4. Emerging issues

In the 18 years since the Act was legislated, the application of experimental space technologies has progressed to a point where significant commercial exploitation has emerged and is increasingly viable. It is now possible, for example, to buy off-the-shelf equipment to enable the construction of micro-satellites with increasingly advanced functionality. While this transition brings obvious commercial opportunity, it also means that the global space market is becoming increasingly congested and competition is intensifying.

This increased activity, and the associated impacts on the sustainability of the space environment, are currently being examined by global regulators, including the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) and the United Nations Office for Outer Space Affairs (UNOOSA).

There is a diversity of views within the international community about how emerging technologies should be managed in order to ensure the sustainable use of the space environment. In examining Australia's space regulatory framework into the future, the Government must determine an appropriate balance between economic activity and global responsibility.

For example, the advancement of small satellite technologies has lowered the cost of accessing space, thereby creating the opportunity to maximise the advantages available through use of the space environment. One consequence of this is the anticipated proliferation of space objects utilising low Earth orbit (LEO) over the next five or so years. Of the nearly 300 satellites launched worldwide in 2014, slightly less than half of these weighed 10 kilograms (22 pounds) or less.² Small satellites have a relatively short life and there is a risk that, without appropriate controls around end-of-life disposal, these objects may significantly increase the problems associated with space debris.

Space debris includes all non-functional human-made objects (including fragments and elements) in orbit or re-entering Earth's atmosphere. There is also a risk of damage on the ground if debris is not burnt up in the Earth's atmosphere. Current debris mitigation measures include restrictions on mission-related debris and end-of-life procedures that seek to remove decommissioned vehicles from areas populated by operational spacecraft.

In 2007, guidelines on space debris mitigation were endorsed by UNCOPUOS providing space-faring nations with a framework to work within; but these guidelines do not impose any binding obligations on participating states.

Australia has not yet adopted a formal mechanism to implement the UNCOPUOS guidelines; however, the guidelines which support the Act do specify that an applicant should provide a debris-mitigation strategy that addresses the UNCOPUOS Guidelines.

The Australian Government has recognised the importance of space debris mitigation in providing \$AUD19.8 million in funding over five years (to June 2019) for the Cooperative Research Centre for Space Environment Management. This enterprise is a collaborative venture between Government agencies, universities and space industry professionals from Australia, USA and Japan.

² The Space Report 2015, The Space Foundation

TOR 4 QUESTIONS

- TOR 4.1 Please rate your agreement to the following statements:**
Strongly disagree; Disagree; Neither agree nor disagree; Agree; Strongly agree; No comment
- *Recent changes in technology and its impact on how space is accessed necessitate changes to Australian space regulation.*
- TOR 4.2 What emerging space technologies or practices should the Government consider in reviewing the Act?**
- TOR 4.3 Considering your answer to Q4.2, what impact might regulating specific emerging technologies have on Australia’s space capability?**
- TOR 4.4 What alternative mechanisms, other than regulation, could the Government utilise to manage the potential impact of these technologies?**

TOR 5. Alignment with Australian legislation and international obligations

The Australian Government has a strong commitment to reducing the regulatory inhibitors on individuals, businesses and community organisations. This means adopting practices that minimise regulatory burden and maximise clarity and transparency. This could also involve collaborating across government in areas of joint or overlapping regulatory responsibility.

Space activities vary in scale and ambition, and an effective regulatory framework must account for these variations. The Government is adopting a risk-based approach in relation to compliance obligations and enforcement responses. This may mean increased targeting of businesses and activities which present a higher risk in relation to the matter being regulated, and adoption of lesser compliance costs for lower risk activities.

However, this does not mean a reduction in regulatory standards, and Government must be able to assure the community that a particular regulation is necessary, beneficial and achieves results in the most efficient way possible. In this regard, it must be stressed that whatever changes (if any) might eventually be forthcoming as a result of this review cannot absolve anyone involved in space-related activities from the obligation to engage in best practice and to take whatever steps are within their capability to protect the broader community.

Australia has an obligation to comply with the five UN treaties on space (see page 2 of this Issues Paper) , and the Australian Government applies its interpretation of these obligations into the terms of its domestic law.

The legislative instruments most relevant to Australian civilian space activities are:

- *Space Activities Act 1998* – regulates launch and return of space objects in Australia or by Australians overseas. Administered by the Department of Industry, Innovation and Science.
- *Radiocommunications Act 1992* - regulates use of spectrum, including communications to/from space systems or satellite networks. Administered by the Australian Communications and Media Authority.
- *Airspace Act 2007* - regulates Australian-administered airspace to ensure safety, protection of the environment, efficient and equitable use of airspace, and national security. Administered by the Civil Aviation and Safety Authority.

TOR 5 QUESTIONS

TOR 5.1 Have you been required to deal with the following agencies regarding the regulation of a space-related activity? *(select all that apply)*

- Department of Industry, Innovation and Science
- Australian Communications and Media Authority
- Civil Aviation and Safety Authority
- Other *(please specify)*

TOR 5.2 Have you been required to deal with more than one of these agencies with regard to the regulation of a single space-related activity? *Yes/No; Please provide additional comment.*

TOR 5.3 What areas of alignment, if any, do you think exist between Australia’s space-related legislation?

TOR 5.4 What risks, if any, are associated with having streamlined processes between Australia’s space-related legislation?

6. Other comments

A public consultation process has been designed to address the terms of reference for the review of the Act. Participants are invited to make additional comments on matters that fall outside these parameters; however, additional comments that do not pertain to the terms of reference may not be considered in the final analysis of input. Where possible, please indicate how your additional comments contribute to the development of Australia’s space capabilities.

Q6.1 Are there any other issues that you think should be considered in the context of the review?

What will happen next

The Australian Government is undertaking extensive government, non-government and international consultation to better understand the legal and policy issues related to developing Australia’s current and future capabilities involving space, particularly in relation to the contribution that space-related activities can make to Australia’s economic and social prosperity.

Following the consultation and analysis phase, the department will present options for Government deliberation, through the Minister for Industry, Innovation and Science. Options could include no change to current arrangements, amendment to the current legislation, or the development of new legislation.

The timing of any announcements on the outcomes of the review will be a matter for Government. Interested stakeholders can register an expression of interest at www.industry.gov.au/spacereview and will be informed of any announcements.

General enquiries can be sent to space@industry.gov.au

Thank you for participating in this public consultation process and for your interest in this review of the Act.