



Asia Pacific Aerospace Consultants

Senate Standing Committees on Economics
Economics Legislation Committee
PO Box 6100
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Canberra, ACT 2600

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Inquiry into Space Activities Amendment (Launches and Returns) Bill 2018 [Provisions]

Submission to Senate Economics Legislation Committee by Asia Pacific Aerospace Consultants (APAC)

Asia Pacific Aerospace Consultants (APAC) welcomes the opportunity to provide input into this Inquiry into the provisions of the Space Activities Amendment (Launches and Returns) Bill 2018.

Asia Pacific Aerospace Consultants is a Sydney based consulting firm staffed by space industry professionals that has been providing consulting services to the space and telecommunications industries both domestically and internationally for over 20 years. APAC is best known in Australia for its three major studies of the Australian space sector for the Australian Government conducted in 2010¹, 2011² and 2015-16³. These studies were the most comprehensive reviews of the Australian space sector ever conducted. They identified the pervasive breadth and significant capabilities of the Australian space sector and uncovered the fact that all major industry sectors in the Australian economy rely on space derived data or space derived services in some way. These studies also generated the headline numbers of annual Australian revenues from the space sector of \$3 billion to \$4 billion per annum and between 9,500 to 11,500 Australians with jobs that involve space that are widely quoted in the media today.

The APAC principals, Kirby Ikin and William Barrett, have long been advocates for the Australian space industry. In 1992 they were co-founders of the Australian Space Industry Chamber of Commerce (ASICC) which was later renamed the Space Industry Association of Australia (SIAA) and served as Chairman and Deputy Chairman of the organisation for 16 years. They remain active in the organisation today as members of the SIAA Advisory Board

¹ A Review of Current Australian Space Activities, Asia Pacific Aerospace Consultants 2010

² A Review of Current Australian Space Activities, Asia Pacific Aerospace Consultants 2011

³ A Selective Review of Australian Space Capabilities, Asia Pacific Aerospace Consultants 2015-16

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and have been involved in virtually every ASIC/SIAA submission to government since the organisation's inception. In particular they have been actively involved in the development of the Space Activities Act 1998 and its Regulations. Mr Barrett was the key liaison between the Government and Industry for the development of the Space Activities Act 1998 and worked directly with the Department of Industry to inject operational knowledge of space launch and satellite operations into the legislative process. Later at Asia Pacific Space Centre developing the proposed spaceport on Christmas Island he was directly involved in trying to obtain the first space and launch licences under the Space Activities Act. He has extensive knowledge of the current Act from the perspective of regulatory intent and from the practical perspective of trying to develop a business in the competitive space environment. APAC regularly advises clients on how to meet their obligations under the Act including the insurance requirements.

It is important to understand the background and context of this legislation. The beginning of the space age with the launch of Sputnik in 1957 caught the world by surprise and commenced an intense period at the United Nations to agree and adopt international treaties governing activities in space. The Outer Space Treaty⁴ entered into force in 1967 followed by The Rescue Agreement⁵ in 1968, The Liability Convention⁶ in 1972, The Registration Convention⁷ in 1976, and the Moon Agreement⁸ in 1984. A key principle of these treaties is that the nation state is responsible for the activities conducted in space by the state or by its citizens and ultimately responsible for any liability or damages to third parties arising out of these activities. This principle was relatively straightforward in an era when only nation states conducted space activities but as private organisations became increasingly active in space it became important to ensure that the private sector activities were conducted in a manner consistent with Australia's obligations under the UN Treaties. The Space Activities Act 1998 was enacted to establish a governance regime to ensure that Australian private sector space activities were conducted in a manner consistent with Australia's UN Treaty obligations.

This legislation is designed to ensure that private Australian space activities are conducted safely and in a way that minimises damage or injury to third parties. The space industry has changed dramatically since 1998 when the Space Activities Act was introduced. The size of the industry has grown from USD \$68.8 billion in 1998⁹ to USD \$345 billion in 2016¹⁰. Private sector activities now comprise over 76% of total space activities compared to only

⁴ Treaty on Principles Governing the Activities of State in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies 1967

⁵ Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space 1968

⁶ Convention on International Liability for Damage Caused by Space Objects 1972

⁷ Convention on Registration of Objects Launched into Outer Space 1976

⁸ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies 1984

⁹ World Space Industry Survey, Euroconsult 1999

¹⁰ Global Space Industry Dynamics, Bryce Space and Technology 2017, p1

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50% in 1998¹¹. The decreasing costs of satellites and launch systems are encouraging new and innovative activities in space. The space industry is widely regarded as one of the growth sectors of the early 21st century and countries are increasingly competing to attract space businesses. It is entirely appropriate and timely for the Australian Government to review the Space Activities Act in the context of this new and emerging commercial market in space.

The key issue with this legislation is to strike a balance that enables and fosters Australian innovation and activity in space while ensuring that the activities are conducted within an appropriate safety envelope. The new legislation acknowledges this in the Objects of Act paragraph 3(b) which states that the purpose of the revised Act is “to ensure that a reasonable balance is achieved between: i) the removal of barriers to participation in space activities and the encouragement of innovation and entrepreneurship in the space industry, and ii) the safety of space activities, and the risk of damage to persons or property as a result of space activities regulated by the Act”.

In the context of the increasingly competitive nature of the space industry it is interesting to note that the United States takes a much more proactive stance in its Commercial Space Launch Activities Act. It actively wants to promote the US space industry including through the legislative instruments as evidenced by the following language:

“The purposes of this chapter are—

- (1) to promote economic growth and entrepreneurial activity through use of the space environment for peaceful purposes;*
- (2) to encourage the United States private sector to provide launch vehicles, reentry vehicles, and associated services by—*
 - (A) simplifying and expediting the issuance and transfer of commercial licenses;*
 - (B) facilitating and encouraging the use of Government-developed space technology;*
- and*
- (C) promoting the continuous improvement of the safety of launch vehicles designed to carry humans, including through the issuance of regulations, to the extent permitted by this chapter; ...”*

APAC believes that the Australian Government could also issue a stronger statement of purpose in support of the Australian space industry to help promote Australia as an attractive jurisdiction for conducting space activities. Australia should ensure that its regulatory regime for space activities:

- 1) Establishes a constructive and supportive environment to attract and foster investment in Australian space activities,
- 2) Ensures that its rules are clear, unambiguous, practically workable and achievable,

¹¹ Ibid

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3) Does not impose regulations on Australian participants that exceed international norms or regulations imposed on Australia's competitors in the space industry.

APAC believes that it is crucial that the Australian space regulatory regime is realistic and workable for both the applicant and the regulator. The Space Activities Act 1998 did create some difficulties in this regard which have largely been addressed in the new legislation. In particular the new legislation updates the terminology to more accurately reflect the nature of the particular activities. This includes replacing the term "space licence" with "facility licence" and also separates the launch facility from the launch vehicle in the regulatory process. This is a welcome change for a number of current Australian companies which plan to provide launch facility and range services as a managed service for a wide range of overseas built launch vehicles. This is just one example of how the nature of the space industry is changing and how the new legislation has adapted to handle this. Another example is the inclusion of mobile platforms including aircraft as possible launch vehicles which reflects current technological trends in the space industry.

APAC believes that the new legislation updates the Australian space regulatory regime in a practical way that provides a suitable framework for the governance of the industry. However, this legislation is only one part of the overall regulatory regime. The other critical part of the regime is the Rules that will further describe the specific conditions for space activities. These Rules are yet to be drafted and the real test of whether the new legislative regime will be workable and positive for Australian space participants compared to their international competitors will depend on the stance taken by the Government in the Rules. APAC would strongly recommend that the Rules be written in a way that facilitates the widest scope of Australian space activity and take a realistic and practical approach to the level of risk involved.

An example of this would be the realm of High Power Rockets which are now included in this legislation. The current Act only covers rockets intended to travel above 100 km. There are however many other experimental and sounding rocket systems that are intended to travel well above typical aircraft flight levels and in principle it makes sense to ensure that they come under a regulatory regime which ensures that the potential damage or injury to third parties remains sufficiently low. However a regime designed for orbital rockets might be overly burdensome for systems designed to travel only fractions of that distance and hence stifle innovation. Australia has a long and proud history as a test site for rocket development and with large remote areas where the risk of damage to persons and property is low Australia remains one of the best places in the world to conduct rocket development tests today. APAC believes that the rules around high power rockets should be carefully crafted to ensure that Australia's attractiveness as a location for rocket development is not diminished. Ideally it should be designed to encourage experimentation and development of new rocket systems. APAC also notes that it is critical to get the

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definition of high power rockets correct to ensure that amateur rocket activities, that are such a valuable student activity for promoting interest in STEM subjects, are not inadvertently driven out of existence by the high power rocket rules.

Another area of concern in the rules is the debris mitigation strategy. Space debris is widely recognised as a growing problem by the international space community and it is understandable that Australia would introduce a debris mitigation strategy requirement as other jurisdictions have done. However the requirements of these strategies vary significantly between jurisdictions and often take the form of guidelines rather than specific requirements. Space debris mitigation is an extremely complex issue with no viable or practical solutions in many cases particularly in the realm of cubesats. Hence it is critical that any rules on space debris for the nascent Australian space industry be practical and workable. APAC would recommend that any such rules be in the form of guidelines rather than specific requirements and should not exceed what is required of the Australian space industry's international competitors in other jurisdictions.

The explosive growth of the space industry has been driven in part by the reduction in size and cost of small satellites and very small satellites known as cubesats. This reduction in cost now makes it possible for small businesses and universities to own and operate satellites. Australia has shown its capability in this area with the launch of four Australian built cubesats in 2017 and this is an area of significant opportunity for Australian space. However, this promising aspect of the Australian space industry is at risk of being stifled by the financial and insurance requirements of the rules.

APAC welcomes the fact that the new legislation has lowered the cap for required third-party liability insurance for launches from Australia or overseas to AUD \$100 million (down from AUD \$750 million). This brings the Australian requirements for third party launch liability insurance into the range of other jurisdictions (US = USD \$100 million, UK = Euro 60 million, France = Euro 60 million). However this masks the fact that the premiums for this level of insurance (in the range of AUD \$100,000 - \$150,000) remain extremely high relative to the cost of the cubesat (AUD \$200,000 - \$700,000 excluding launch costs). The current Act provides a mechanism for reducing the insurance requirements below that cap with a detailed analysis of risk known as Maximum Probable Loss (MPL) calculations. For example early analysis by Asia Pacific Space Centre using MPL calculations for launches from Christmas Island showed that third party liability insurance in the range of \$15 million - \$30 million would be sufficient to meet the Australian requirements – well below the current \$750 million cap (SpaceX currently achieves similar numbers via MPL calculations for its launches under the US Act). APAC strongly recommends that the government retain avenues in the rules to reduce the third party insurance requirements by a more thorough assessment of risk.

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This level of third party liability insurance is designed to cover the Australian government in the event of claims under the Liability Convention. However in the 50 years of spaceflight since the start of the UN Treaties there has only been one claim (in the 1970's) under the Liability Convention and it was ultimately settled privately. The major area of concern for Australian participants is with Australian satellites launched overseas. Virtually all jurisdictions require their launch providers to have third party liability insurance. The US Government relies on this and does not even require a licence for its nationals for launches overseas. The Australian requirement that the payload owner also procure insurance essentially amounts to double insurance in these cases. The absence of claims over 50 years of spaceflight and the fact that all launches already have third party liability insurance mandated by the launching jurisdiction raises the real question of whether there is any practical risk to the Australian Government in the case of Australian satellites launched overseas. APAC strongly recommends that this risk profile be more fully analysed and that mechanisms be included in the rules to minimise, eliminate or waive the third party insurance requirements for overseas payload permits.

The fee structure for the various permits will be set in the rules. The current fee structure was established under the principle of full cost recovery by Government for the regulatory services it provides. APAC notes that one of the surest ways to stifle a nascent industry is to include the costs of the bureaucrats regulating the industry into the overheads of the fledgling businesses. This is not an effective mechanism for building a successful industry in a promising new market. APAC strongly recommends that the fee structures be set in a way that encourages the Australian space industry and establishes Australia as a practical and attractive place to conduct space business.

In closing APAC would like to acknowledge the significant efforts of all those in Government who contributed to the review of the Space Activities Act and the formulation of the new legislation. APAC recognises the considerable effort expended to reach this point and the further work ahead in the drafting of the rules in this complex and fast changing field.

APAC is available to the Senate Economics Committee for further discussion or clarification of any aspects of this submission.

Sincerely,

William E Barrett
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