

# Development of the New Zealand and Australian Space Industries

## *Regulation for a Sustainable Future*

*Melissa de Zwart and Joel Lisk\**

### **Abstract**

This paper considers the recent developments in Australia and New Zealand in the domain of domestic space law: the review of the Space Activities Act 1998 (Australia) and the implementation of domestic space law in New Zealand. The patterns of ratification and adoption of the international space treaties by Australia and New Zealand are radically different and reflective of their respective historical approaches to space activities. Australia initially approached space activities with significant vigour and enthusiasm, evidenced by its early engagement with the outer space treaties, and the research, development and launch activities at Woomera in South Australia. New Zealand, by comparison, has only recently made the decision to ratify the international treaties, and only then in the context relevant to its proposed activities with Rocket Lab. Both countries have unique attributes in terms of geography, levels of technological advancement and available workforce, yet in each case the move to implement domestic legislation for space activities has been precipitated by projects managed by foreign entities. The Space Activities Act was prompted by the Kistler Aerospace Spaceport Woomera proposals and New Zealand is responding to the Rocket Labs launch plans. In each case the main driver for reform was foreign investment. This paper will therefore ask, in the context of this history, how both Australia and New Zealand could develop and implement legislative and regulatory frameworks that will encourage, support and sustain domestic space industries. It will consider the potential role of a Space Agency in the governance context, and draw comparisons from the European Space Agency and Canadian Space Agency models, addressing strengths and weaknesses and the very different domestic, political and historical contexts. A key focus here will be on the importance of regulating for sustainability: in the sense of ongoing success of any domestic space industries, but also with respect to related domains, such as environmental, employment and security issues.

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\* Professor Dr Melissa de Zwart, Adelaide Law School, University of Adelaide, Australia. Mr Joel Lisk, Adelaide Law School, University of Adelaide, Australia.

## I. Introduction

Space is currently a key focus of economic development in the commercial sector, start-up companies are empowered by the continual reduction in operation costs, the benefits of miniaturisation and the near endless opportunities that space provides for services, science and exploitation. As a proportion of launches government sponsored missions are declining, with commercial activities increasing year on year. Commercial launch operations are currently dominated by a small number of large companies; SpaceX, United Launch Alliance, Ariane Space, and Orbital ATK to name a few. These companies act as partners for government and private enterprises internationally; launching a variety of space objects, from CubeSats to large geostationary communications satellites. These launches are required by international law to be authorised by national legal regimes; mechanisms that governments employ to ensure their continuing compliance with their international obligations, primarily the *Outer Space Treaty*,<sup>1</sup> and the sovereign risk that accompanies private activities. The Australian Government was the sixth nation to implement a national regime, introducing the *Space Activities Act* in 1998<sup>2</sup> at a time when the private launch industry was just gaining momentum. Despite the initial enthusiasm, there has not been a private commercial launch under this regime. Comparatively, private launches have already occurred in New Zealand, with test launches occurring prior to the implementation of the new enabling legislation. Both of these instruments stress the significance of national legal regimes to commercial circumstance in an environment where the suitability of a launching location is not the only factor that drives commercial activity.

However, whilst these regimes follow a similar pattern they reflect different approaches to regulation, specifically in matters of scope and regulatory impact and, perhaps, willingness to engage with and support the commercial space sector.

## II. Background

### 1. International Law

International space law is composed of treaties, multi-lateral agreements, custom and practice. Modern day space is regulated by five 'Space Treaties' administered by the United Nations. These treaties directly bind their State

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1 *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, Opened for signature 27 January 1967, 610 UNTS 205 (entered into force 10 October 1967), ('*Outer Space Treaty*') Article VI.

2 *Space Activities Act 1998* (Cth).

parties, with commercial entities bound by domestic laws that implement the operative provisions of the ‘Space Treaties’. These treaties inform the actions of States and how they implement domestic regulatory regimes.

The five treaties; the *Outer Space Treaty*, *Rescue Agreement*, *Liability Convention*, *Registration Convention* and *Moon Agreement*, sit as the primary instruments regulating space; with each holding a varying degree of weight in respect of the obligations they impose. These instruments are also complimented by varying soft law instruments.

## 2. Australia

Australia was initially an active participant in space exploitation. As a founding member of UNCOPUOS, Australia was well positioned to take advantage of a developing space industry; both as a participant in launching activities and by providing essential ground services. Despite an initial burst of activity that saw the 1967 launch of WRESAT-1, making Australia the third country to launch an ‘indigenous’ satellite from its own territory.<sup>3</sup> By the early 1990s, the Australian space industry stalled. It was later revived by a number of proposals for commercial spaceports within Australia; a standout being the proposal for launches by Kistler Aerospace. This saw the introduction of the *Space Activities Act 1998* (Cth). Although the spaceport proposal fell flat, the Act provides for a variety of licences; space licence, launch permit, overseas launch permit, return authorisation and an exemption certificate.<sup>4</sup> This Act is complemented by the *Space Activities Regulation 2001* (Cth). Since inception, only the overseas launch permit and return authorisation have been used. 2015 saw the announcement of a Review of the Space Activities Act, resulting in the Department of Industry, Innovation and Science (DIIS), the entity responsible for the Act, indicating it will begin to reformulate the entirety of the Act in March of 2017.<sup>5</sup> The Australian Government has also announced a review into the nation’s space industry capabilities, with an issues paper released in August 2017<sup>6</sup> and a report expect in March 2018.<sup>7</sup>

3 Steven Freeland, ‘Reshaping Australia’s Space Policy and Regulation – Recent Developments (2012) 61 *Zeitschrift für Luft- und Weltraumrecht* 99.

4 *Space Activities Act 1998* (Cth) ss 18, 26, 35, 43, 46.

5 Department of Industry, Innovation and Science, ‘Reform of the Space Activities Act 1998 and associated framework’ (Legislative Proposals Paper, 24 March 2017) <https://industry.gov.au/industry/IndustrySectors/space/Documents/Legislative-Proposals-Paper.pdf> 30.

6 Review of Australia’s Space Industry Capability, Issues Paper, August 2017 <https://industry.gov.au/industry/IndustrySectors/space/Documents/Review-of-Australias-Space-Industry-Capability-Issues-Paper.pdf>.

7 Minister for Industry, Innovation and Science, ‘Expert review of Australia’s space industry capabilities to participate in global market’ (Media Release, 13 July 2017)

### 3. New Zealand

Comparatively, New Zealand has not been a major player in the space industry. The recent push into the space industry has been prompted by Rocket Lab, a United States based company with a New Zealand subsidiary. Rocket Lab is focused on delivering low cost launch operations for small satellites. Rocket Lab has completed the construction of its ‘Launch Complex 1’ on the Mahia Peninsula of New Zealand as well as its first test launch in 25 May 2017.<sup>8</sup>

The *Outer Space and High Altitude Activities Act 2017* (NZ) passed the New Zealand Parliament in July of 2017, with it entering into force on 21 December 2017. This Act provides for launch permits, payload permits, overseas launch permits, overseas payload permits and a facility permits.<sup>9</sup>

### III. Critical Analysis

The Australian and New Zealand regimes share a number of features but each are distinct in their approach and style. The New Zealand government, taking an intentionally informed approach, has utilised elements from several different space regulatory regimes and models, while the *Space Activities Act* is a regime enacted in the late 1990s, focused on protecting Australia against sovereign risks and catering for a ‘big launcher’ audience, placed firmly in the context of obligations under the space treaties.

On the face of the laws, there is little substantive difference in the phrasing, style and content of the primary legislation. The permit provisions of both regimes are sufficiently proximate in their classification, worded in the ‘may’ format, and grant the responsible Minister discretion on a number of factors. These significant similarities bring into question the validity of the New Zealand position that the regimes are based on a differing approach. When looking deeper into the content of each regime, the differences do begin to appear, with New Zealand’s primary legislation containing a significant number of compulsory licence terms, while the Australian regime focuses on broader obligations. However, both rely heavily on regulations to fill in the details of the regime outlined in the principal Act. New Zealand is yet to release draft regulations that will accompany the Act, which prevents a full analysis of the legislative regime. Regulation may provide evidence of a more

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[www.minister.industry.gov.au/ministers/sinodinos/media-releases/expert-review-australia's-space-industry-capabilities-participate](http://www.minister.industry.gov.au/ministers/sinodinos/media-releases/expert-review-australia's-space-industry-capabilities-participate).

8 Rocket Lab, ‘Rocket Lab Launch Complex 1 Complete’ (Website News Post, 27 September 2016) <https://www.rocketlabusa.com/latest/rocket-lab-launch-complex-1-ready-for-launches/>; Rocket Lab, ‘Rocket Lab successfully makes it into space’ (Website News Post, 25 May 2017) <https://www.rocketlabusa.com/latest/rocket-lab-successfully-makes-it-to-space-2/>.

9 *Outer Space and High-altitude Activities Act 2017* (NZ) pt 2, sub-pts 1-5.

‘permissive’ approach, but is highly unlikely based on an analysis of the primary legislation provided.

### 1. Contextual Comparison

Looking to the contextual introduction of the *Space Activities Act* and the *Outer Space and High-altitude Activities Act*, commercial pressure is the clear driver; the major distinction being scale. The space players that catalysed the introduction of the *Space Activities Act* were all intending to launch large satellites on big rockets; a function of the technology of the time. Contrastingly, the New Zealand Act is the result of lobbying and activities from Rocket Lab, responding to an industry focused on smaller satellites and the miniaturisation of space technologies. This would have been a foreign concept at the introduction of the *Space Activities Act*, with the first CubeSat launched in 2003.<sup>10</sup> The most obvious consequence of this, and it is discussed further below, is the regulatory and financial burden placed on the permit holders.

A further consideration is New Zealand’s position in respect of international obligations. At introduction of its national legal regime, Australia was a signatory to all five space treaties and an active member of UNCOPUOS. Comparatively, New Zealand is currently not a party to the *Registration Convention* or the *Moon Agreement* and was only admitted to UNCOPUOS in December 2016.<sup>11</sup> This reiterates that New Zealand never contemplated itself as a major actor in the space industry until prompted by a commercial entity. It should be further noted that the review of the *Space Activities Act* acknowledges the shift in industry focus towards a miniaturisation of satellites and the need to regulate accordingly.<sup>12</sup>

A common thread between the circumstances is the use of operating contracts; with both Kistler Aerospace and Rocket Lab entering into agreements with the Australian and New Zealand governments respectively to ensure national compliance with international obligations.<sup>13</sup>

Although the regimes are 19 years apart, their introduction can be considered to be similar contextually, with commercial agitation and a government response.

10 Alan Shaw and Peter Rosher, ‘Micro Satellites: The Smaller the Satellites, the Bigger the Challenges?’ (2016) 4/5 *Air and Space Law* 311, 311.

11 *International cooperation in the peaceful uses of outer space*, GA Res 71/90, UN GAOR, 71<sup>st</sup> sess, 53<sup>rd</sup> plen mtg Agenda Item 48, UN Doc A/RES/71/90 (6 December 2016) [32].

12 Steven Freeland ‘Analysis Report: Public Submissions into the Australian Government’s Review of the Space Activities Act 1998’ (August 2016) 8.

13 Explanatory Memorandum, *Space Activities Bill 1998* (Cth) [1]; Ministry of Business, Innovation and Employment, ‘Govt signs contract authorising Rocket Lab launches’ (Media Release, 16 September 2016) [www.mbie.govt.nz/about/whats-happening/news/2016/govt-signs-contract-authorising-rocket-lab-launches](http://www.mbie.govt.nz/about/whats-happening/news/2016/govt-signs-contract-authorising-rocket-lab-launches).

## 2. Format

Both the *Space Activities Act* and the *Outer Space and High-altitude Activities Act* share a similar structural format, dividing the licence and permit regimes contained in the regime by activity and location. This allows for a situationally aware approach to the law; permitting a commercial operator to identify the appropriate licence with relative ease.

With Australia drafting the *Space Activities Act* in the context of significant commercial interest, the Act's division based on activities intuitively links with the aspirations of companies wanting to operate launch facilities. This is discernible on the face of the legislation; a space licence allowing for the operation of a launch facility and launch vehicles, then individual launch permits for each launch/series of launches. The division of the licences also clarifies the approach of the Australian Government to ensure that all activities of a launching nature are caught within the scope of the permit regime, with the overseas launch certificate unambiguously permitting Australian associated launch activities in other countries.

The use of clear activity based titles, in addition to information as to geographical applicability, makes the *Outer Space and High-altitude Activities Act* accessible and clear in its applicability. The benefit of the New Zealand Act is the differentiation between launch activities and obligations for payload owners, a distinction not clear in the *Space Activities Act*. The simplicity of the New Zealand regime in this regard cannot be overstated, with the New Zealand Ministry of Business, Innovation and Employment (MBIE) clearly recognising the benefits of the activity divided system and tailoring it to their benefit.

The primary point of difference between the regimes is the reflection of changed commercial practices, and of course the vastly greater number and scale of multi-purpose payload launches. At the time of the introduction of the Australian legislation, it was envisaged that Australia would be a primary launch provider and that such launches would consist primarily of large, single purpose payloads. However, as a result of changed requirements regarding trajectory and target orbit, as well as a more entrepreneurial approach to user-pays, multiple purpose, and payload services, overseas payload launching is common practice now for Australian businesses. The *Space Activities Act* therefore applies a generic 'overseas launch permit' for both launching and payloads.

The New Zealand Act with its distinction between launch and payload related activities, is clear in which licences are required in which circumstances. The activity based regime has its significant benefits, ensuring that the appropriate safeguards are in place during the respective application processes, while facilitating an ease of understanding for commercial operators.

### 3. Applicant Character Test

A unique component to the *Outer Space and High-altitude Activities Act's* launch, overseas launch and facility licences is a 'fit and proper person' test,<sup>14</sup> a test used frequently in New Zealand permit and licence regimes.<sup>15</sup> s 52 of the Act provides process through which 'fit and proper' is to be determined. This allows for an exploration of the applicant's regulatory compliance history, aviation and aerospace experience, knowledge of the regulatory regimes, mental health, convictions, and any other matters the Minister believes relevant before a licence or permit is granted.<sup>16</sup>

The format of the test has seen slight variations between iterations of the Act prior to royal assent, with the test moved from a satisfaction threshold requirement, that the applicant be a fit and proper person, to a test where the Minister may reject an application if they are of the belief that the applicant is not a fit and proper person.<sup>17</sup> The purpose of this is purported to be a reduction in the regulatory burden on application as there is no requirement to prove 'fit and proper' on application.

The application of this test varies slightly dependent on the type of applicant; in the case of a corporate applicant, the test shifts its focus to the body corporate itself and its officers.<sup>18</sup> This proposition is counterintuitive as New Zealand law does not recognise the concept of 'officers' under the *Companies Act 1993* (NZ).<sup>19</sup> This is contrasted against the Australian legislative and common law position.<sup>20</sup> 'Officers' was a defined term in the *Securities Markets Act 1988* (NZ) as persons who are 'concerned or takes part in the management of the public issuer's business', a definition similar to that of the Australian position. This Act was repealed in 2014, before the drafting of the *Outer Space and High-altitude Activities Act*.

This is a definition that suits the circumstances, with a 'launch operator' likely to employ persons who profess to have significant expertise in respect of the launch of rockets, playing a major role in the company's affairs. With the development of international sustainability guidelines and best practice

14 *Outer Space and High-altitude Activities Act 2017* (NZ) ss 9(2)(b)-(c), 25(2)(b)-(c), 40(2)(b)-(c).

15 See the New Zealand application processes for maritime and aviation authorisations, auditor licences, vehicle inspection authorisations.

16 *Outer Space and High-altitude Activities Act 2017* (NZ) s 52.

17 Compare *Outer Space and High-altitude Activities Bill 2016* (NZ) 179-1 against *Outer Space and High-altitude Activities Bill 2016* (NZ) 179-3.

18 *Outer Space and High-altitude Activities Act 2017* (NZ) s 52(3).

19 *Companies Act 1993* (NZ); cf *Corporations Act 2001* (Cth) which defines *officer* explicitly within s 9.

20 *Securities Markets Act 1988* (NZ) s 2; *Shafron v. Australian Securities and Investments Commission* (2012) 247 CLR 465; *Corporations Act 2001* (Cth) s 9 (definition of 'Officer').

efforts, this will continue to be a developing area of law, especially with respect to corporate governance and space activities.

The *Space Activities Act* does not feature any comparable legislative test beyond the requirement for an applicant to a space licence, launch permit and a return authorisation to be ‘competent’,<sup>21</sup> a measure not explicitly defined in the Act or Regulation.

The use of a ‘fit and proper person’ test is a curiosity when compared to the Australian position, but in referencing the broader New Zealand regulatory environment, appears to be a commonplace test to ensure that qualified, responsible individuals are the only people permitted to conduct certain activities. It is to be considered whether this test reflects yet another aspect of the serious concern regarding the potential damage which could be occasioned by catastrophic launch failure or whether it reflects a more recent concern with national security issues.

#### **4. Commercial Operations**

The commercial efficacy of a national legal regime is founded within the regime’s application; what regulatory burdens the primary legislation impose and the formulation of any secondary instruments. High costs and regulatory burdens will see operators shirk away from a jurisdiction in favour of more commercially friendly one.

The *Space Activities Act* imposes a relatively high burden on applicants, a fact noted across a number of submissions and highlighted in the Submission Analysis Report.<sup>22</sup> One submission even went so far as to label the Act as ‘draconian and restrictive’ and an ‘absolute deterrent against space activities in Australia’.<sup>23</sup> Although most submissions to the review were significantly more conservative, the general sentiment of overly excessive complexity and burden is evident, with the Submission Analysis concluding by identifying a ‘widespread perception’ of high regulatory burden that requires rectification’.<sup>24</sup>

Launch operators, if they were to use facilities in Australia, are required to hold space licences for the launch facility, launch vehicle and flight paths in addition to individual licences for each launch. This potentially causes significant regulatory costs, with the application fee for a space licence being AU\$ 300,000, with yearly renewals of AU\$ 190,000. Furthermore, launch

21 *Space Activities Act 1998* (Cth) ss 18(a), 26(3)(c), 43(3)(a).

22 Steven Freeland ‘Analysis Report: Public Submissions into the Australian Government’s Review of the Space Activities Act 1998’ (August 2016) 48.

23 Warwick Holmes, Submission No 39161057 to the Department of Industry, Innovation and Science, *Review of the Space Activities Act 1998*, 2016, Terms of Reference 1, Question 3.

24 Steven Freeland ‘Analysis Report: Public Submissions into the Australian Government’s Review of the Space Activities Act 1998’ (August 2016) 55.



licences are subject to AU\$ 40,000 application costs and, if in a series of launches, AU\$ 10,000 for subsequent launches. While these costs are significantly less for approved scientific or educational organisations, it is unrealistic to operate commercially from Australia.<sup>25</sup>

The exact application process and cost burden under the *Outer Space and High-altitude Activities Act 2017* is yet to be released, with the regulation still in development at the time of writing. Acknowledging this, it is difficult to discern the full impact on companies attempting to comply with the provisions. Within the primary legislation, there are significant obligations for each permit type. The launch licence is composed of more than a dozen compulsory terms relating to the conduct of launches, processes and required pre-flight consultations; in addition to a range of discretionary terms and those to be contained in the yet-to-be released regulation. Comparatively, the *Space Activities Act* contains four compulsory terms for the launch licence,<sup>26</sup> with remaining conditions contained in the Space Activities Regulation.<sup>27</sup> When considering this on its face, there are less legislative burdens on operators in Australia, with regulation imposing further requirements. This also questions the New Zealand premise of a 'permissive' regime that does not unnecessarily burden corporate entities.

The impact of legislation on commercial operations is undeniable, with any company aiming to reduce the burden it faces, aim for profitability and ensure efficiency. The contents and subsequent practical application of each regime are essential for supporting or deterring the development of industry, with the true test for the *Outer Space and High-altitude Activities Act* coming when commercial launchers attempt to comply with its terms, rather than the contractual agreement that Rocket Lab is currently operating under.

## 5. Insurance

One of the largest commercial burdens on operators under any national space regime is insurance. The *Outer Space Treaty*<sup>28</sup> and *Liability Convention*<sup>29</sup> impose financial liability with the relevant 'launching state'.<sup>30</sup> Nations generally shift the liability that may be incurred under the international law to operators.<sup>31</sup> The Australian Act was developed in the context of large corporate launching parties, clearly discernible through one of the highest

25 Space Activities Regulation 2001 (Cth) part 9.

26 *Space Activities Act 1998* (Cth) s 29.

27 Space Activities Regulation 2001 (Cth) div 3.2.

28 *Outer Space Treaty* art VII.

29 *Liability Convention* arts II, III.

30 'Launching State' is a term defined in the *Liability Convention* art I(c) and *Registration Convention* art I(a) as a method of determining responsibility for objects in space.

31 Cecile Gaubert 'Insurance in the context of space activities' in Frans von der Dunk (ed) *Handbook of Space Law* (Edward Elgar Publishing, 2015) 910, 914-915.

insurance requirements of any national legislation; AUD\$ 750,000,000.00.<sup>32</sup> This is partially mitigated by what is known as the Maximum Probably Loss (MPL),<sup>33</sup> with the Act requiring that a permit holder possess the lower of these two measures. Despite this, the MPL has been highly criticised due to its vague nature, heavy reliance on statistical assumptions and general inability to conclusively determine the level of risk.<sup>34</sup> Ministerial exemptions from the insurance requirements can be granted when applying for an overseas launch permit.<sup>35</sup> This, in theory, allows for Australian parties to enter launch agreements where the foreign launch partners provides insurance covering the requirements of the Act.

The Australian requirements faced significant criticism in the public submissions to the Space Activities Act Review summarised as carrying a sentiment that the requirements are ‘significantly out of proportion to the size and potential risk of the proposed space activit[ies]’,<sup>36</sup> and further, that the requirements ‘swamp small companies and raise significant barriers to developing new technologies’.<sup>37</sup> The Analysis Report considers a number of alternate regimes, with the DIIS Legislative Proposals Paper recognising the need to reform with a focus on ‘flexibility...as need arises’.<sup>38</sup>

Comparably, the New Zealand Act adopts the more ‘permissive’ approach it advertises. No specific minimum or default insurance level is codified in the text of the Act. Rather it sets the insurance as a measure for the Minister to determine in the licence conditions.<sup>39</sup> The insurance requirements are highly

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32 *Space Activities Act 1998* (Cth) s 48(3); Steven Freeland ‘Analysis Report: Public Submissions into the Australian Government’s Review of the Space Activities Act 1998’ (August 2016) 67-68.

33 *Space Activities Act 1998* (Cth) s 48(3)(a).

34 *Space Activities Act 1998* (Cth) s 48(3); Steven Freeland, ‘Analysis Report: Public Submissions into the Australian Government’s Review of the Space Activities Act 1998’ (August 2016) 66-67 citing Singtel Optus Pty Limited, Submission to Department of Industry, Innovation and Science, *Review of the Space Activities Act 1998*, May 2016, [4.5].

35 *Space Activities Act 1998* (Cth) s 35(3).

36 Steven Freeland ‘Analysis Report: Public Submissions into the Australian Government’s Review of the Space Activities Act 1998’ (August 2016) 58.

37 Steven Freeland ‘Analysis Report: Public Submissions into the Australian Government’s Review of the Space Activities Act 1998’ (August 2016) 60; Michael Smart, Submission Number 117801313 to the Department of Industry, Innovation and Science, *Review of the Space Activities Act 1998*, 2016, Terms of Reference 3, Question 3.

38 Department of Industry, Innovation and Science, ‘Reform of the Space Activities Act 1998 and associated framework’ (Legislative Proposals Paper, 24 March 2017) <https://industry.gov.au/industry/IndustrySectors/space/Documents/Legislative-Proposals-Paper.pdf> 22.

39 See *Outer Space and High Altitude Activities Act 2017* (NZ) ss 10(2)-(3), 18(2), 26(2)-(3), 34(2), 41(2).

proximate across the different permits and licences, with the primary difference residing in the payload permits and the use of ‘may’ to allow for recognitions of international waiver agreements and the contractual terms of launch partners.

The more significant component of the New Zealand legislation which has been critiqued is the requirement for Crown indemnification. Each licence may require a full indemnification of the Crown for any actions that may be brought against it under international law.<sup>40</sup> This has been openly criticised by Rocket Lab as potentially ‘pose[ing] a risk to the creation of a local space industry.’<sup>41</sup> The MBIE did not consider this a significant industry concern.<sup>42</sup> Commercial reality does intervene, any company pursued for losses suffered by the New Zealand Government will likely enter into insolvency due to the potential scale of any claim made, leaving the New Zealand Government liable for damages. Of note is a statement included in the Explanatory Memorandum to the *Space Activities Act*; the Australian Government included the \$ 700,000,000 or MPL threshold as they were of the belief that the ‘[i]mposition on launch operators of unlimited liability is neither commercially tenable nor desirable from a competitive standpoint’,<sup>43</sup> a potential outcome of the phrasing of the *Outer Space and High-altitude Activities Act*.

When comparing the two approaches, the *Space Activities Act* provides commercial certainty. There are two levels of insurance that can be required, with a maximum of \$ 700,000,000 capable of being required. The New Zealand Act does not convey such certainty; the use of ‘may’ potentially sees the liability of an applicant under the regime ranging from nothing through to unlimited liability, an outcome devoid of any certainty as discretion is the key for this regime.

## 6. Sustainability

Sustainability is a developing area of concern for States, especially in respect of increasing issues associated with debris accumulation in orbit. Environmental protection is codified in Article IX of the *Outer Space Treaty*, requiring parties to avoid harmful contamination of the space environment.<sup>44</sup> Debris can be fatal to space activities with an estimated 166 million pieces

40 *Outer Space and High-altitude Activities Act 2017* (NZ) ss 10(3), 18(2)(a), 26(3), 34(2)(a), 41(2).

41 Rocket Lab, Submission to the Foreign Affairs, Defence and Trade Select Committee, *Outer Space and High-altitude Activities Bill*, 30 November 2016, 2.

42 Ministry of Business, Innovation and Employment, ‘The Outer Space and High-altitude Activities Bill’ (Department Report, 9 March 2017) [https://www.parliament.nz/resource/en-NZ/51SCFDT\\_ADV\\_00DBHOH\\_BILL71017\\_1\\_A550646/90312559133d9bcc80036d264ac9e345e6d93839](https://www.parliament.nz/resource/en-NZ/51SCFDT_ADV_00DBHOH_BILL71017_1_A550646/90312559133d9bcc80036d264ac9e345e6d93839) [68]-[80].

43 Explanatory Memorandum, *Space Activities Bill 1998* (Cth) [26].

44 *Outer Space Treaty* art IX.

currently in orbit, of which only 29,000 are large enough to be tracked, debris is a growing concern for many space operators.<sup>45</sup> The gravest of outcomes, as contemplated by the Kessler Syndrome, is that debris may accumulate to the point where further space activities are impossible due to the likelihood of collision.

Space environment protections are completely foreign to the *Space Activities Act*, with the only mention of environmental approvals being made in respect of the domestic requirements for construction of launch facilities in Australia.<sup>46</sup> Comparatively, debris mitigation has been a component of each iteration of the New Zealand regime since inception.<sup>47</sup> Upon reintroduction into Parliament after Committee analysis, debris mitigation shifted from a discretionary regulation term to primary legislative threshold for Minister satisfaction, a change prompted by oral evidence from New Zealand based ‘Venture Southland’, an economic promotion body.<sup>48</sup> Furthermore, the Act contains further ability to impose discretionary terms related to minimising ‘the risk of contamination of outer space or adverse changes in the earth’s environment’.<sup>49</sup>

The review of the *Space Activities Act* has yielded a similar response, with the Legislative Proposals Paper suggesting that a revised Act contain ‘a high level statement committing applicants to consider the space environment’.<sup>50</sup> The paper specifically mentions the Space Debris Mitigation Guidelines, introduced by UNCOPUOS, to provide guidance as to the specific obligations that should be enshrined in statute. This is a significant step beyond the current regime where any debris mitigation requirements are likely to be

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45 Space Debris Office, *Space Debris by the Numbers* (January 2017) European Space Agency, [http://m.esa.int/Our\\_Activities/Operations/Space\\_Debris/Space\\_debris\\_by\\_the\\_numbers](http://m.esa.int/Our_Activities/Operations/Space_Debris/Space_debris_by_the_numbers).

46 *Space Activities Act 1998* (Cth) s 18(aa).

47 Outer Space and High-altitude Activities Bill 2016 (NZ) 179-1 cl 88(1)(1); Outer Space and High-altitude Activities Bill 2016 (NZ) 179-2 cls 9(1)(ca), 17(1)(aa), 25(1)(ca), 33(1)(aa), 88(1)(1); Outer Space and High-altitude Activities Bill 2016 (NZ) 179-3 cls 9(1)(ca), 17(1)(aa), 25(1)(ca), 33(1)(aa), 88(1)(1); *Outer Space and High-altitude Activities Act 2017* (NZ) ss 9(1)(c), 17(1)(b), 25(1)(c), 33(1)(b), 88(1)(1).

48 Oral evidence not available publicly; Ministry of Business, Innovation and Employment, ‘The Outer Space and High-altitude Activities Bill’ (Department Report, 9 March 2017) [https://www.parliament.nz/resource/en-NZ/51SCFDT\\_ADV\\_00DB\\_HOH\\_BILL71017\\_1\\_A550646/90312559133d9bcc80036d264ac9e345e6d93839](https://www.parliament.nz/resource/en-NZ/51SCFDT_ADV_00DB_HOH_BILL71017_1_A550646/90312559133d9bcc80036d264ac9e345e6d93839) [53]-[54].

49 *Outer Space and High-altitude Activities Act 2017* (NZ) ss 10(1)(i)(v), 18(1)(f)(v), 26(1)(d)(v), 34(1)(e)(v).

50 Department of Industry, Innovation and Science, ‘Reform of the Space Activities Act 1998 and associated framework’ (Legislative Proposals Paper, 24 March 2017) <https://industry.gov.au/industry/IndustrySectors/space/Documents/Legislative-Proposals-Paper.pdf> 18.

discretionary in nature and do not constitute part of the primary or secondary legislation.

#### IV. SPACE AGENCY

Space agencies were seen as the centre piece of a country's space operations. Pioneering agencies such as America's NASA and the ESA have set the public expectation of a space agency. Many countries now have space agencies that sit at the apex of government space science programs. These include; the China National Space Administration (CNSA), Indian Space Research Organisation (ISRO), Korean Aerospace Research Institute (KARI), Japan Aerospace Exploration Agency (JAXA), Russian Roscosmos State Corporation and countless others.

Despite the Australia's long history of space involvement, it has no dedicated space agency. Civil space is regulated by a number of different entities dependent on the activity being conducted, the use and the policy. These departments and agencies cooperate under the banner of the Space Coordination Committee, an entity composed of 12 different government departments, each with specified interest in space. The entity is tasked with focusing on policy and uses of space. The bulk of the responsibility lies with the DIIS, specifically the Civil Space and Cyber Security Division of the department. This body is tasked with the primary regulation of civil space, authorising and supervising space activities under the *Space Activities Act*, previously the role of the Space Licencing and Safety Office. Numerous submissions to the review mooted the idea of a formal space agency as both an encouragement for the further development of the Australian space industry and to cooperate internationally. The Submission Analysis Report clearly takes the position that the DIIS already sits as a quasi-space agency body, responsible for engaging with the civil space sector, administering the relevant Act and acting as a point of contact for space activities.<sup>51</sup>

The New Zealand Government formally instituted the 'New Zealand Space Agency', a division of the Ministry of Business, Innovation and Employment, in April of 2016. The Agency has been specifically tasked with regulation, supporting the industry, engaging international partners, directing policy and strategy, and promoting the industry generally. This space agency holds a similar role to the DIIS in Australia; a purely regulatory and policy based body.

The traditional image of a space agency, such as NASA, CSA and the ESA, are focused on space sciences, exploration and technology development; areas neither the DIIS or New Zealand Space Agency have been tasked with.

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51 Steven Freeland 'Analysis Report: Public Submissions into the Australian Government's Review of the Space Activities Act 1998' (August 2016) 128.

National space sciences lie within distinct science departments, not within the ambit of either countries space regulation bodies.

The European Space Agency ('ESA') is a coordinated agency between a 22 European States and Canada. Established in 1975, the ESA is a space agency completely dedicated to the exploration of space; holding a completely scientific purpose. It does not hold a regulatory role in any European jurisdiction.<sup>52</sup> Similarly, the Canadian Space Agency ('CSA') is another body that is primarily tasked with scientific purposes. The body was established in 1989.<sup>53</sup> This is another body that is purely scientific, with space activity licencing occurring through the Canadian Launch Safety Office under the *Aeronautics Act*.<sup>54</sup>

These agencies sit in contrast to the Australian DIIS and New Zealand Space Agency. As a purely regulatory instrument, the New Zealand Space Agency is unlikely to be seen as effective, as is the case in Australia; with the primary difference being title recognition through 'space agency', while Australia retains a departmental title. An ideal model would see all government space efforts consolidated; merging the science and regulatory functions. Not only would this see an increase in the awareness of space activities, but may encourage the further development of space related industry, in space and in terms of ground services. The Australian Government announced a new review into the national space capabilities in July 2017, with one of the terms of reference focused on determining whether a new regulatory body – read space agency – is required to support the Australian space sector.<sup>55</sup>

## V. Conclusion

These legal regimes each face their contextual limits. For a current day launch operator, the New Zealand Outer Space and High-altitude Activities regime is more likely to foster and support the development of a commercial

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52 Each European country that is active in space activities has its own regulatory regime, for example, see Norway: *Act on launching objects from Norwegian territory into outer space* (1969); Sweden: *Act on Space Activities* (1982), *Decree on Space Activities* (1982); France: *French Space Operations Act* (2008); the administration of each of these regimes is domestic, with no power ceded to the ESA.

53 Canadian Space Agency, *Organization* (10 October 2014) Government of Canada [www.asc-csa.gc.ca/eng/about/csa\\_organization.asp](http://www.asc-csa.gc.ca/eng/about/csa_organization.asp).

54 *Aeronautics Act 1985* (Canada); Transport Canada, *Launch Safety Office* (27 January 2014) Transport Canada [www.tc.gc.ca/eng/civilaviation/opssvs/general-lso-menu-2018.htm](http://www.tc.gc.ca/eng/civilaviation/opssvs/general-lso-menu-2018.htm).

55 Minister for Industry, Innovation and Science, 'Expert review of Australia's space industry capabilities to participate in global market' (Media Release, 13 July 2017) [www.minister.industry.gov.au/ministers/sinodinos/media-releases/expert-review-australia's-space-industry-capabilities-participate](http://www.minister.industry.gov.au/ministers/sinodinos/media-releases/expert-review-australia's-space-industry-capabilities-participate); Review of Australia's Space Industry Capability Issues Paper, August 2017, 13-14.

industry; with distinct licences and permits separated by activity and launch location. The Australian regime imposes a high regulatory burden on a launch operator; both through requirements to hold a number of licences simultaneously and by imposing high insurance and application costs. The New Zealand regime is not without its limits, with the potential for high insurance costs and flexibility which may render commercial certainty non-existent, furthermore, high numbers of compulsory licence terms may decrease the efficiency of operators, increasing costs and potentially discouraging a launch industry. Sustainability is markedly more dominant in the New Zealand regime and signify the shift towards a more environmentally aware space sector.

The *Space Activities Act* is clearly an instrument of the 1990s, with practical limitations on its current applicability. Neither regime considers many developing commercial areas of practice with no consideration of objects made in space, resource exploitation or general regulation of activities after launch, a fact noted in the DIIS response to the Space Activities Act Review. These are instruments of launch authorisation and serve a basic purpose of ensuring that international obligations are complied with. It will be fascinating to observe how ever-expanding and developing space technologies continue to challenge the attempts to design and administer domestic and international regulation and how various models of space governance foster and support emerging space economies. At the moment, many of the advancements appear to be in rhetoric rather than outcomes.

