CURRENT STATUS AND RECENT DEVELOPMENTS IN AUSTRALIA'S NATIONAL SPACE LAW AND ITS RELEVANCE TO SPACE LAW AND SPACE ACTIVITIES IN THE PACIFIC RIM

Ricky J. Lee[*]

INTRODUCTION

For the country that some regard as the third in the history of the world to launch a satellite into outer space, Australia probably has the most comprehensive legal and regulatory regime for private space activities in the Pacific Rim region, with the possible exception of the United States.[1] Prompted by increasing prospects for private launch activities being conducted in Australia, the enactment of the Space Activities Act (1998) by the Commonwealth Parliament of Australia has led to the evolution of a comprehensive regulatory framework for private space launch activities as well as the implementation of the in-

[*] Senior Associate, Schweizer Kobras (Australia). Director of the International Institute of Space Law, fellow of the Commercial Law Association of Australia and member of the Outer Space Committee of the International Bar Association, the Editorial Board of *Convergence* and the International Law Section of the Law Council of Australia. The author would like to thank Prof. Joanne Irene Gabrynowicz, the National Centre for Remote Sensing, Air and Space Law at the School of Law, University of Mississippi, and the *Journal of Space Law* for their kind invitation for him to attend the Pacific Rim National Space Law Summit of 19-21 May 2009 in Honolulu, the United States, to present this paper. The views and opinions expressed in this paper are those of the author personally and do not necessarily represent those of any organisation with which the author may be associated. The contents of this paper are not, and are not intended to be, legal advice and may not necessarily reflect the most recent developments in the law.

[1] *See* Kerrie Dougherty, *Upper Atmospheric Research at Woomera: The Australia-Built Sounding Rockets*, 59 ACTA ASTRONAUTICA 54 (2006); Press Release, University of Adelaide, 40th Anniversary of Australia's First Satellite (Nov. 29, 2007), http://www.adelaide.edu.au/news/news23081.html; *see also* Mark T. Rigby, *WRESAT: Australia's First Satellite*, (Oct. 24, 2001) (WRESAT is an abbreviation for Weapons Research Establishment Satellite), http://homepage.powerup.com.au/~woomera/wresat.htm.

ternational legal principles arising from the five United Nations space treaties to which Australia is a party.

With the space industry becoming increasingly privatised and multinational in nature, many States – both industrialised and developing – are increasingly sensing the need to enact domestic space laws to deal with the international regulatory, responsibility, and liability obligations under international treaties.[2] States with significant past or present governmental space programs, such as Brazil,[3] the Republic of Korea (South Korea),[4] the Russian Federation,[5] the Ukraine,[6] the United Kingdom,[7] and the United States,[8] as well as States with substantial private sector involvement in space activities, such as Australia,[9] Belgium,[10] Hong Kong,[11] Norway,[12] South Africa,[13]

---

[2] *See* Ricky J. Lee, *Legal and Policy Aspects of Launch Services Provided by Governmental and Private Providers*, *in* PROCEEDINGS OF ISRO-IISL SPACE LAW CONFERENCE 2005 – "BRINGING SPACE BENEFITS TO THE ASIAN REGION", at 1-3 to 1-40 (V. Gopalakrishnan & Rajeev Lochan, eds., 2005) [hereinafter *Legal and Policy Aspects of Launch Services*].

[3] Regulation on Procedures and on Definition of Necessary Requirements for the Request, Evaluation, Issuance, Follow-up and Supervision of Licences for Carrying Out Launching Space Activities on Brazilian Territory, Portaria A.E.B., No. 27 (2002). (Brazil).

[4] Space Liability Act, No. 8852 (2007) (S. Korea), http://unoosa.org/oosaddb/showDocument.do?documentUid=402&level2=none&node=ROK1970&level1=countries&cmd=add.

[5] Law on Space Activities, Res. No. 5663-1 (Aug. 20, 1993) (Russ.).

[6] Ordinance of the Supreme Soviet of Ukraine, on Space Activity, Law of Ukraine (Nov. 15, 1996) (Ukraine), http://unoosa.org/oosaddb/showDocument.do?documentUid=320&level2=none&node=UKR1970&level1=countries&cmd=add.

[7] Outer Space Act, Ch. 38 (1986) (U.K.), http://www.unoosa.org/oosa/en/SpaceLaw/national/united_kingdom/outer_space_act_1986E.html.

[8] Commercial Space Launch Amendments Act of 2004, H.R. 5382, Pub. L. No. 108-492, 108th Cong., 2d Sess.

[9] Space Activities Act 1988, An Act about space activities, and for related purposes, No. 123 (1998) (Cth.), http://www.unoosa.org/oosa/en/SpaceLaw/national/australia/space_activities_act_1998E.html.

[10] Law on the Activities of Launching, Flight Operations or Guidance of Space Objects (2005) (Belg.), http://www.belspo.be/belspo/res/rech/spatres/Loi/Loi_en.pdf.

[11] Outer Space Ordinance, (1997) Cap. 523 (H.K.), http://www.legislation.gov.hk/blis_pdf.nsf/6799165D2FEE3FA94825755E0033E532/3D53F187E7687316482575EF00139E26/$FILE/CAP_523_e_b5.pdf.

[12] Act on Launching Objects from Norwegian Territory into Outer Space, No. 38 (June 13, 1969) (Nor.), *available at* http://unoosa.org/oosaddb/showDocument.do?documentUid=324&level2=none&node=NOR1970&level1=countries&cmd=add.

[13] Space Affairs Act, No. 84 (1993) (S. Afr.),*available at* http://www.unoosa.org/oosa/en/SpaceLaw/national/south_africa/space_affairs_act_1993E.html.

and Sweden,[14] have all enacted domestic national space laws dealing with space launch activities, particularly in the last fifteen years. This is in addition to the enactment of domestic laws dealing with satellite operations and radio-communications that has already taken place in most States of the world. However, the extraterritorial nature that is intrinsic of national laws dealing with private launch activities and the lack of harmonisation in such national laws has led to the potential of "forum shopping." As other States in the Pacific Rim region start to enact national laws dealing with space activities, the existing Australian laws can serve as models of legal and regulatory provisions in other States.

This paper considers the content and development of national laws dealing with the regulation of launch activities under the Space Activities Act and the manner and form by which they implement the relevant international instruments and corresponding obligations. The relevance of the Australian domestic laws to other States in the Pacific Rim region is then discussed in the context of the various international and regional issues concerning space activities and how the Australian domestic laws can serve as legal and regulatory models for other States in the Pacific Rim.

I. REGULATION OF LAUNCH ACTIVITIES UNDER AUSTRALIAN LAW

A. The Space Activities Act 1998 (Cth.)

i. Overview

The Space Activities Act came into force in Australia when it received Royal Assent on December 21, 1998 and the Space Licensing and Safety Office (SLASO) was created to administer it. Since then, it has been amended by subsequent legislation on a number of occasions.[15] The Space Activities Act represents

---

[14] Act on Space Activities, No. 963 (1982) (Swed.), *available at* http://unoosa.org/oosaddb/showDocument.do?documentUid=318&level2=none&node=SWE1970&level1=countries&cmd=add.

[15] The Space Activities Act was amended in 2001 by the Space Activities Amendment (Bilateral Agreement) Act, No. 101 (2001) (Cth), to implement a bilateral agree-

a legislative attempt to develop a robust and comprehensive regulatory regime for space activities in conformity and implementation of the international treaties.

The Space Activities Act provides for regulations, a form of subordinate or delegated legislation that do not require parliamentary enactment, to be enacted where necessary and convenient to give effect to its provisions.[16] As a consequence, most of the necessary administrative details of the regulatory framework were left to the Space Activities Regulations (2001) (Cth.). As the Space Activities Act commenced in December 1998 and the Space Activities Regulations did not enter into force until June 28, 2001, there was in effect a 30-month long moratorium on Australian launch activities. The Space Activities Regulations have also been amended on a number of occasions since in 2001.[17]

---

ment with the Russian Federation for cooperation on private launch activities, and again in 2002 when the Space Activities Amendment Act, No. 100 (2002) (Cth), was enacted in October 2002 to make various rectifying amendments and changes to the applicability and liability provisions as well as the introduction of special arrangements for scientific or educational space activities. *See* Space Activities Act, *supra* note 9, (amended by the Space Activities Amendment (Bilateral Agreement) Act, No. 101 (2001) (Cth), *available at* http://www.austlii.edu.au/au/legis/cth/num_act/saaaa2001397/; and the Space Activities Amendment Act, No. 100 (2002) (Cth), *available at* http://www.austlii.edu.au/au/legis/cth/num_act/saaa2002247/.

[16] *See* Acts Interpretation Act § 46B, (1901), *available at* http://www.austlii.edu.au/cgi-bin/sinodisp/au/legis/cth/consol_act/aia1901230/s46b.html?query=acts%20interpretation%20act%201901 (Regulations are a form of legislative instrument that, in this case, are made by the Governor-General of Australia on advice of the Cabinet. Although they do not require parliamentary approval, they must be tabled in both Houses of Parliament within fifteen sitting days of their enactment and may be disallowed by either House of Parliament within twelve sitting days.).

[17] The Space Activities Regulations, No. 186 (2001) (Cth.), were amended on July 3, 2002 by the Space Activities Amendment Regulations, No. 1 (2002) (Cth), the Space Activities Amendment Regulations, No. 1 (2003) (Cth), and the Space Activities Amendment Regulations, No. 1 (2004) (Cth). *See* The Space Activities Regulations, No. 186 (2001) (Cth.), *available at* http://www.austlii.edu.au/cgi-bin/sinodisp/au/legis/cth/num_reg_es/sar20012001n186303.html?query=space%20activities%20regulations%202001 (amended by the Space Activities Amendment Regulations, No. 1 (July 3, 2002) (Cth), *available at* http://www.austlii.edu.au/cgi-bin/sinodisp/au/legis/cth/num_reg_es/saar200212002n166410.html?query=space%20activities%20amendment%20regulation; the Space Activities Amendment Regulations, No. 1 (2003) (Cth), http://www.austlii.edu.au/cgi-bin/sinodisp/au/legis/cth/num_reg_es/saar200312003n33410. html?query=space%20activities%20amendment%20regulation; and the Space Activities Amendment Regulations, No. 1 (2004) (Cth), http://www.austlii.edu.au/cgi-bin/sinodisp/au/legis/cth/num_reg_es/saar200412004n79410.html?query=space%20activities%20amendment%20r

In addition to the Space Activities Act, there are several other laws that directly relate to the conduct of launch activities by private launch operators. These laws include:

(1) the Civil Aviation Safety Regulations (1998) (Cth.) and, in particular, Part 101 thereof, which came into force on July 1, 2002 and deals with airspace clearances and airspace exclusion areas for space launch operators;

(2) the Customs (Prohibited Exports) Regulations (1958) (Cth.) that implements Australia's international obligations concerning export controls on rocket, missile and satellite technologies, such as those under the Wassenaar Arrangement on Export Controls for Conventional arms and Dual Use Goods and Technologies and the international Missile Technology Control Regime;[18]

(3) the Transport Safety Investigation Act (2003) (Cth.) regulates all accident investigations conducted by the Australian Transport Safety Bureau (ATSB);[19]

(4) the Christmas Island Space Centre (APSC Proposal) Ordinance (2001) (C.I.) and the corresponding Christmas Island Space Centre (APSC Proposal) Regulations (2001) (C.I.), which are legislative instruments for Christmas Island and relate to the previously proposed construction and use of land for a commercial launch facility by Asia Pacific Space Centre Pty Ltd on Christmas Island;[20] and

---

egulation). The Senate Standing Committee on Regulations and Ordinances gave notice of motion to disallow the Space Activities Regulations in the Australian Senate on September 20, 2001 because of the legislative requirement for private information about employees and deemed employees to be provided to the Government. The notice of motion was subsequently withdrawn on September 27, 2001 as a result of assurances from the Government that all employees and deemed employees are to be notified of the launch operator's disclosure obligations under the Space Activities Act.

[18] Wassenaar Arrangement on Export Controls for Conventional Arms and Dual Use Goods and Technologies (1996), *available at* http://www.wassenaar.org [hereinafter Wassenaar Arrangement]; and the Missile Technology Control Régime 26 I.L.M. 539 (1987).

[19] It is not made explicitly clear whether the Transport Safety Investigation Act or the Space Activities Act would prevail in the event of an inconsistency. *See* Transport Safety Investigation Act (2003) (Cth.), *available at* http://www.austlii.edu.au/au/legis/cth/consol_act/tsia2003374/; and the Space Activities Act, *supra* note 9.

[20] A motion to disallow the Christmas Island Space Centre (APSC Proposal) Ordinance (2001) (C.I.) and the corresponding Christmas Island Space Centre (APSC Pro-

(5) the Customs Tariff Amendment (No. 4) Act (2001) (Cth.), which amended the Customs Tariff Act (1995) (Cth.) to provide for the exemption of the goods and equipment imported into Australia in direct connection with a space launch from import duties and tariffs.[21]

ii. Regulated Space Activities

In all other States with legislative or regulatory frameworks for space launches, private space activities are generally regulated by an all-inclusive licence.[22] In Australia, on the other hand, the Space Activities Act provides for the several different categories of regulatory approvals for different types of launch activities and they are as follows:

(1) a "space licence" for operating a launch facility in Australia in conjunction with a specific launch vehicle along particular flight paths;[23]

(2) a "launch permit" for a launch operator to launch a space object or a series of space objects from Australia;[24]

---

posal) Regulations (2001) (C.I.) was moved by the Australian Greens on June 19, 2002 on the basis that they did not provide adequate environmental safeguards and public consultations in the construction of the launch facility on Christmas Island by Asia Pacific Space Centre Pty Ltd. *See* Christmas Island Space Centre (APSC Proposal) Ordinance (2001) (C.I.), *available at* http://scaleplus.law.gov.au/ComLaw/Legislation/LegislativeInstrument1.nsf/0/86F3D60277FC1A0CCA257006000253C5/$file/F2005B01580.pdf; and Christmas Island Space Centre (APSC Proposal) Regulations (2001) (C.I.), *available at* http://www.comlaw.gov.au/ComLaw/Legislation/LegislativeInstrument1.nsf/asmade%5Cbydate/B7E42745C3197F6DCA25700C008087EA?OpenDocument. The motion was defeated on June 20, 2002 with all other parties all voting against the disallowance motion.

[21] Australian Customs Notice No. 2001/48, Space Concession (July 17, 2001), *available at* http://www.customs.gov.au/site/content2090.asp.

[22] *See*, *e.g.*, Commercial Space Launch Act, Pub. L. No. 98-575, 98 Stat. 3055 (1984) (codified at 49 U.S.C. §§ 2601-2623 (1984)) (U.S.); Outer Space Act, *supra* note 7; Space Affairs Act, *supra* note 13; and Act on Space Activities (1982) (Sweden); *available at* http://www.unoosa.org/oosaddb/showDocument.do?documentUid=318&level2=none&node=SWE1970&level1=countries&cmd=add. *See also* discussion in Ricky J. Lee, *The Liability Convention and Private Space Launch Services – Domestic Regulatory Responses*, 31 ANNALS AIR & SPACE L. 351 (2006).

[23] Space Activities Act, *supra* note 9, § 15.

[24] *Id*. § 11. The launch permit may also licence an associated return of the launch vehicle and/or the payload to Australia. *Id.* § 26.

(3) an "overseas launch certificate" for an Australian satellite owner to launch a space object or a series of space objects overseas;[25]

(4) an "authorisation of return" for the return to Australia of a space object that was launched from overseas;[26] and

(5) an "exemption certificate" to provide for emergency launches.[27]

In the case of "approved scientific or educational organisations," the Space Activities Act subjects them to the same regulatory burden as commercial launch operators, but the fees payable in relation to each required licence are substantially reduced.[28] The Space Activities Act requires the Australian Government to enact guidelines on the criteria for an organisation to be declared as an "approved scientific or educational organisation."[29] Accordingly, the Space Activities (Approved Scientific or Educational Organisations) Guidelines (2004) (Cth.) sets out the matters that the Government must take into consideration in deciding whether an applicant organisation is an "approved scientific or educational organisation."[30]

B. Regulation of Launch Activities in Australia

i. Space Licences

With the space licence and the launch permit, the Space Activities Act separates the approval for the launch facility, launch vehicles and particular flight paths from that of the particular

---

[25] *Id*. § 12.
[26] *Id.* § 14.
[27] *Id.* § 46; *see also* Space Activities Regulations, *supra* note 17, § 6.01.
[28] Space Activities Act, *supra* note 9, § 59(6A).
[29] *Id.* § 8A-B.
[30] The Government is required to consider the extent to which the principal function and principal activities of the organisation and the proposed space activities are educational and/or scientific in nature, whether the organisation is a non-profit organisation and the sources of the organisation's funding in deciding whether an organisation would be declared to be an "approved scientific or educational organisation": *Space Activities (Approved Scientific or Educational Organisation) Guidelines 2004* (Cth), § 4, *available at* www.comlaw.gov.au.

launch.[31] In other words, the grant of a space licence is a prerequisite to the application of a launch permit to undertake a specific launch. This separation was made with the intent of streamlining the approval process for specific launches and, as a result, improving the competitiveness of the Australian launch industry. However, the complexity of the regulatory regime, especially in relation to flight safety concerns, would appear to nullify any benefits that may be derived from the separation.

ii. Launch Permits

Launch permits are required to authorise single launches or series of launches of the same or similar payloads.[32] Launch permits may also provide for the return of launch vehicles and/or space objects back to Australia, provided that the return is "connected" with the launch.[33] While this clearly covers the return of a reusable launch vehicle as being connected with the launch, this creates uncertainty in the case of returning the space object. If the return of the space object is connected with the launch, then a launch operator may be responsible and liable for the satellite operator returning the satellite with which the launch operator has no control. On the other hand, if the return of a satellite is not connected with a launch, then the Space Activities Act in fact does not provide for returns of Australian-launched payloads except by means of an exemption certificate, for authorisations of return only deal with overseas-launched space objects. As an exemption certificate is intended for emergency space activities only, the Australian Government can rectify this issue simply by including Australian-launched space objects in the scope of an authorisation of return.

As the demarcation between airspace and outer space remains unclear in the context of international law, some means of defining the applicability and scope of the Space Activities Act is required. In the United States, a launch involving a rocket of less than two hundred thousand pounds per second of

---

[31] Space Activities Act, *supra* note 9, § 18.
[32] Space Activities Act, *supra* note 9, §§ 11 and 26.
[33] *Id.* § 26(2).

impulse and a ballistic coefficient of less than twelve pounds per square inch does not require a licence.[34] The Australian Government has opted instead to set an applicability threshold as defined by altitude, so that a launch taking place in Australia will need to be licensed if the launch vehicle and/or payload is intended to reach an altitude of 100 kilometres above mean sea level or higher.[35]

iii. Flight Safety

The Flight Safety Code (Code) sets out the requirements for launch operators to demonstrate the safety and effectiveness of their proposed launch activities. The Code sets out the safety standards that have to be complied with by launch operators and the Space Activities Regulations require launch operators to undertake a risk hazard analysis in compliance with the Code, carried out either independently or by an employee of the launch operator. In an application for a launch permit, the launch operator is required to submit a flight safety plan to demonstrate its compliance with the Code.[36]

The Code measures the risk to public health and safety by calculating the "casualty expectation," or E_C, being the average number of casualties that can occur as a result of an event if the event were repeated thousands of times.[37] With the risk of oversimplifying it, the casualty expectation of a launch can be calculated by:

$$E_C = P_E \times P_{IIE} \times N_F \times A_C \times \frac{N_P}{A_P}$$

where:

- P_E is the probability of the event, which can be the probability of failure of a particular event occurring in a particular interval of flight time;

---

[34] 14 C.F.R. § 400.2.

[35] Space Activities Act, *supra* note 9, § 8.

[36] Space Activities Regulations, *supra* note 17, § 3.04(4)(j).

[37] Commonwealth of Australia, Space Licensing and Safety Office, *Flight Safety Code* (2d ed., 2002), ¶ 2.1, *available at* http://www.innovation.gov.au/General/MECSLASO/Documents/FSC_Pubn1__20050602105043.pdf.

- P_{IIE} is the conditional probability given the event during a particular interval of flight time that fragments of a particular type will land on the "casualty area;"
- N_F is the number of fragments of the type of fragments referred to above that are likely to be generated by the launch;
- A_C is the "casualty area" associated with each fragment in which an individual is a casualty due to direct fragment impact or, in other words, the size of the area that one piece of the fragment would cause a casualty if a person is in the area; and
- N_P / A_P is the population density of the casualty area.[38]

In the case of a commercial satellite launch, the probabilities of all events in each phase or time interval of the launch process are considered. Therefore, the total collective casualty expectation is the sum of the E_C values for all applicable time intervals, which in turn are calculated by the sum of the E_C values for all modes of failures. This is generated from the assumed rates of the failure modes and multiplying those rates with the duration of the flight time interval.[39] In this cumulative process, slight adjustments have to be made to the casualty expectation of each time interval to account for the probability of the launch not having failed in the previous time interval, even though this adjustment may be so small as to be negligible. In order for a flight safety plan to be approved, the casualty expectation calculated must not exceed the minimum launch safety standards prescribed in the Code as set out in Table 1 below. The Code also gives special consideration to the destructive effects of trigger debris on assets of high value or national significance. The Code defines "trigger debris" as debris of a particular shape, weight, velocity or explosive potential that can trigger a catastrophic chain of events on a "designated asset" or

---

[38] *Id.* ¶ 4.2.5.
[39] *Id.* ¶¶ 4.2.6-.14.

"protected asset."[40] The quantity and type of trigger debris produced in association with a particular failure event is determined on the basis of expert engineering analysis and either agreed to by the launch operator and the owner of the asset or as determined by the Australian Government in the absence of agreement between the parties.[41]

Table 1. Minimum Australian Launch Safety Standards

SPECIFIC RISK	STANDARD
Maximum permitted third party collective risk (the sum of all individual risks)	1×10^{-4} per launch
Maximum permitted third party individual risk	1×10^{-7} per launch
Maximum permitted third party individual casualty risk on a per year basis	1×10^{-6} per year
Maximum permitted probability per launch of debris impact on a designated asset	1×10^{-5} per launch
Maximum permitted probability per year of debris impact on a designated asset	1×10^{-4} per launch
Maximum permitted probability per launch of trigger debris impact on a designated asset	1×10^{-7} per launch
Maximum permitted probability per year of trigger debris impact on a designated asset	1×10^{-6} per launch

The "designated assets" and "protected assets" are determined and declared by the Government and published in the *List of Designated and Protected Assets*.[42] Designated assets are assets that require special protection as a result of their remoteness and inaccessibility as well as the impact of their destruction on the Australian economy and its exports.[43] A launch must take into account the higher standards of risk management required in relation to designated assets, as set out in Ta-

[40] *Id.* ¶ 3.2.5.

[41] *Id.* ¶ 3.2.6.

[42] Space Licensing and Safety Office, *Commonwealth of Australia Space Activities Act 1998: Administrative Arrangements for the Classification of Assets for Space Launch Activities* (June 7, 2002), *available at* http://www.asicc.com.au/Documents/AdminArrClassificationofAssets6-6-02.pdf.

[43] Space Licensing and Safety Office, *Commonwealth of Australia Space Activities Act 1998: List of Designated and Protected Assets* 7 (June 17, 2002), *available at* http://www.asicc.com.au/Documents/ListDesignatedProtectedAssets6-6-02.pdf. The list of designated assets currently includes oil and natural gas facilities located in the Timor Sea, the Carnarvon Basin off the Western Australian coast and the Cooper Basin in South Australia.

ble 1. Protected assets are assets that underpin the economic activity of a whole region, a state, or Australia as a whole and reflect the concern that the Australian Government has for the protection of the oil and gas industry from a possible catastrophe arising from space launch activities.[44] A launch must not have a protected asset within ten kilometres of the 1×10^{-7} impact probability isopleth for trigger debris.[45] It was recently estimated by the Government of Western Australia that damage to an offshore oil and gas facility by trigger debris may amount to A$25 billion, not including the likely economic loss arising from such damage.[46]

In creating designations of high-value assets and requiring the risk hazard analysis process to take them into special consideration, the Australian Government has done more than most other States in reducing the risks and potential liabilities arising from commercial space activities. However, this also reflects the influence of the oil and gas industry on the policy priorities of the Australian Government.[47] While this may be seen as an additional and unnecessary regulatory burden, it can also be considered a positive step in the active reduction of the safety risk of space launches and a move that will increase public confidence in the Australian future space launch industry.

---

[44] *Id.* This list of protected assets include the Burrup Peninsula, North Rankin and Goodwyn platforms and natural gas facilities, being the main gas supplies for Western Australia and for export; the Cossack floating facility producing oil and gas for export; the Ballera natural gas facility that constitutes the main gas supply for Brisbane and coastal Queensland; the Moomba natural gas facility that constitutes the main gas supply for Adelaide, Canberra, Sydney and rural New South Wales; the Palm Valley and Mereenie natural gas facilities that supply all the gas requirements of the Northern Territory; and the proposed Bayu-Undan platform to produce natural gas for large parts of Australia and to be a major revenue source for East Timor.

[45] *Flight Safety Code*, *supra* note 37, ¶ 3.2.7.

[46] Senate, *Official Hansard of Parliamentary Debate*, p. 5319 (Oct. 17, 2002), *available at* www.aph.gov.au. This estimate is expressed in 2002 Australian dollar terms.

[47] The Australian Petroleum Production and Exploration Association has been active in advocating increased protection for platforms and other high-value oil and gas facilities in the regulatory framework for launch services: *see* House of Representatives, *Official Hansard of Parliamentary Debates*, p. 29193 (Aug. 6, 2001); and Senate Economics Legislation Committee, *Report on the Space Activities Amendment Bill 2002* (Aug. 2002).

iv. Financial and Insurance Requirements

The Space Activities Act requires a launch operator to demonstrate its compliance with the insurance and financial responsibility requirements through an approved insurance compliance plan.[48] The Space Activities Act requires the launch operator to hold insurance policies to cover against any liability the Government and the launch operator may have to pay compensation to third parties.[49] It is possible for the launch operator to demonstrate that it has sufficient assets to pay any third party compensation claim instead of having to rely on insurance, but this is unlikely to occur, due to the high amount that would be required.[50]

The amount of the insurance cover required is either A$750 million, as indexed from time to time, or the amount of the "maximum probable loss" (MPL) as determined by the Australian Government.[51] The MPL for a launch is determined by the application of the methodology contained in the *Maximum Probable Loss Methodology*.[52] The MPL calculation must be done by an independent person suitably experienced and qualified and is divided into third party casualty losses, third party property losses, environmental damage, and economic loss.[53] A separate calculation is required for the downrange flight portion of the launch from that of the launch itself, so that the total applicable MPL for a launch is the combined MPLs for the launch component and the downrange flight component.

In general terms, the MPL is the maximum amount of loss that may result from a given launch that results from failure events that have a higher chance of occurring than the "probability threshold." The "probability threshold" is a measure to distinguish between likely and unlikely events and their corre-

---

[48] Space Activities Regulations, *supra* note 17, § 3.04(4)(k). *See also* the Space Activities Act, *supra* note 9, at part 3, division 7.

[49] Space Activities Act, *supra* note 9, § 48(1).

[50] Space Activities Regulations, *supra* note 17, § 7.01.

[51] Space Activities Act, *supra* note 9, § 48(3).

[52] Space Licensing and Safety Office, *Maximum Probable Loss Methodology* (2d ed. 2002), *available at* http://www.asicc.com.au/Documents/MPLmethodology10702.pdf.

[53] Space Activities Regulations, *supra* note 17, § 7.02(2).

sponding losses, using the event probabilities derived from the hazard risk analysis of the flight safety plan. The probability threshold in Australia is prescribed as 1×10^{-7}, or one in ten million, which is comparable to that of the United States.[54] Given that probability threshold, the largest and most costly accident within that threshold and the casualty area that contains all the possible debris impact points within the probability threshold are chosen for the purposes of a governmental determination of the MPL amount. In other words, the loss of a property that has a risk of less than one in ten million will not be taken into account when determining the MPL of a particular launch.

Table 2. Methodology for Calculating Maximum Probable Loss[55]

CATEGORY	METHODOLOGY
Third party casualty losses	A value of A$5,000,000 is attributed to each casualty that is likely to occur in the casualty area, as determined by multiplying the casualty area with its population density.
Third party property losses	This can be determined by either: • 50% of the third party casualty loss estimate; or • where the flight safety plan identified a single high-value property within the probability threshold area (such as an oil platform), a specific analysis of the property damage to that property is required.
Environmental damage	This is determined by the higher result of two calculations: • A$100,000; or • if there is a particular high-value property in the impact area, the accurate cost associated with restoring the environment.
Economic loss	This is determined by the higher result of two calculations: • by multiplying the number of estimated third party casualties with the gross domestic product per capita; or • by the sum of the loss-of-use estimates of high value assets based on engineering and financial estimates for that facility.

[54] *Maximum Probable Loss Methodology*, *supra* note 52, at 7.
[55] *Id.* at 8-11.

C. Regulation of Australian Overseas Launch Activities

i. Applicability

The Space Activities Act does not make a distinction between overseas launch operators of Australian nationality and Australian payload owners launching overseas, as any "responsible party" for an overseas launch would appear to be required to hold an overseas launch certificate.[56] The Space Activities Act defines a "responsible party" as being an Australian that carries out a launch or owns, in full or in part, the payload launched from overseas.[57] As a result, the requirement of an overseas launch certificate is imposed on both Australian launch operators and satellite operators for satellites launched overseas and, from a regulatory perspective, this is appropriate as Australia would be a launching State for then purposes of the Liability Convention in either case.

It is clearly in the interest of the Australian Government to seek to pass on its liability to the launch operator or the payload owner where Australia is a launching State of an overseas launch. However, such extraterritorial legislation would only have effect in imposing civil or criminal sanctions if the Australian national was within Australian jurisdiction at the time. As a result, while an Australian satellite operator is likely to be in Australia at the time of the overseas launch, this is unlikely to be the case involving an overseas launch operator of Australian nationality. In the absence of any bilateral agreement between the governments concerned, this affords negligible protection to Australia in the absence of any bilateral or multilateral agreement concerning the licensing and insurance cover for claims made under the Liability Convention.

ii. Financial Responsibility

An application for an overseas launch certificate has to satisfy the insurance or financial responsibility requirements of the

---

[56] Space Activities Act, *supra* note 9, § 12.
[57] *Id.* § 8.

Space Activities Act in order to provide financial protection to the Australian Government. The Space Activities Act requires the responsible party to have insurance sufficient to cover the Australian Government against any liability under the Liability Convention or any other provision of international law.[58]

As with a launch permit, the amount of the insurance cover required is either A$750 million or the maximum probable loss of the launch as determined by the Australian Government, whichever is lower.[59] The maximum probable loss for an overseas launch is either the amount as determined in the case of an Australian launch under a launch permit or the amount assessed by an insurance analyst jointly appointed by the Australian Government and the responsible party to be the amount of liability to pay compensation that the Government may incur as a result of the launch.[60]

D. Regulation of the Return of Overseas-Launched Space Objects

The Space Activities Act provides that an authorisation of return is required when an overseas-launched space object is returned to Australia.[61] It must be noted that the Australian Government is not liable internationally for any loss or damage suffered as a result of a return destined for Australia as it would not be regarded as a launching State.[62] The requirement of an authorisation of return is thus clearly intended to protect potential Australian nationals from injury, loss, or damage from the return. In the case of an Australian-launched space object being returned to Australia, the return segment is simply authorised and regulated as a part of the launch permit.[63]

In satisfying the financial responsibility requirements of an authorisation of return, the Space Activities Act imposes the

---

[58] *Id.* § 48(2).

[59] *Id.* § 48(3).

[60] Space Activities Regulations, *supra* note 17, §§ 7.02 and 7.03(1).

[61] Space Activities Act, *supra* note 9, § 14.

[62] Convention on International Liability for Damage Caused by Space Objects, art. I, *opened for signature* Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187, http://www.oosa.unvienna.org/pdf/publications/STSPACE11E.pdf [hereinafter Liability Convention].

[63] Space Activities Act, *supra* note 9, § 13.

same requirements on authorisations of return as those for launch permits.

E. Launch Safety and Accident Investigation

i. Launch Safety Officer

The Government is required by the Space Activities Act to appoint a launch safety officer for each launch facility licensed under a space licence.[64] The launch safety officer has the responsibility of ensuring that the Space Activities Act and the Space Activities Regulations are complied with and that no person or property is endangered by a launch that takes place at the facility.[65]

The launch safety officer has the following powers:

(1) to enter and inspect the launch facility and any space object, including the inspection and testing of any equipment, with the consent of the holder of the space licence;[66]

(2) to request for the provision of any information or assistance from the launch operator that is relevant to safety or the launch operator's compliance with the conditions of the space licence or the launch permit;[67]

(3) to give directions concerning the launch and any associated return of a space object to be carried out at the launch facility that are necessary to avoid any danger to public health, with which the launch operator must record and report the steps taken accordingly;[68]

(4) give directions requiring the launch or return to be aborted or the space object to be destroyed at any time where necessary, with which the space licence holder must record and report the steps taken accordingly;[69]

---

[64] Space Activities Act, *supra* note 9, § 50.
[65] *Id.* § 51.
[66] *Id.* § 52(2)(a).
[67] *Id.* § 52(2)(b).
[68] *Id.* §§ 52(2)(c)-(d), and Space Activities Regulations, *supra* note 17, § 8.03.
[69] *Id.*

(5) where the seriousness and urgency of the circumstances necessitate a search of the launch facility to locate a thing relating to a possible offence under the Space Activities Act that may be lost, concealed or destroyed, to undertake such a search and, if found, seize the thing;[70] and

(6) The launch safety officer also has the primary responsibility for ensuring that the Australian Government and the public are notified of an imminent launch.[71] Such a notice must be given to the prescribed government authorities between two to ten days before the launch, specifying the date and time of the launch.

It appears that the launch safety officer also has the responsibility of ensuring that Airservices Australia is informed for the purposes of airspace clearance, even though Part 101 of the Civil Aviation Safety Regulations (1998) (Cth.) imposes that responsibility on the launch operator itself.[72] If there is any residential community within fifty kilometres of the launch facility, the launch safety officer must also ensure that notifications are given to all local newspapers, radio stations, and other community media within the notification period for broadcast.[73] On the day of the launch, the notice must again be broadcast on all local radio stations some hours before the launch.[74]

ii. Investigation of Accidents

The Space Activities Act provides a regime for investigations of incidents or accidents that took place during the liability period and the ATSB would carry out such investigations.[75]

The term "liability period" under the Space Activities Act means the period of thirty days from the launch or from a relevant re-entry manoeuvre to the time when the space object

---

[70] Space Activities Act, *supra* note 9, § 56(1).

[71] *Id.* § 51(a) and (aa).

[72] Civil Aviation Safety Regulations (1998) (Cth.), § 101.450, *available at* http://www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD:1001:pc=PC_90991.

[73] Space Activities Regulations, *supra* note 17, § 8.01(2).

[74] *Id.* § 8.01(5).

[75] Space Activities Act, *supra* note 9, § 84.

comes to rest on Earth.[76] It appears from the Space Activities Act that the Australian Government intends to limit the time for which a launch operator is liable to third parties to the liability period.

Under the Space Activities Act, an "accident" is where a person died or suffered serious injury or if property was destroyed or seriously damaged.[77] An "incident" is where an accident nearly occurred or where an event took place that affects or could affect the safety of the present and future operations of the launch operator.[78] The reason why such a distinction is made is because the Government *must* appoint a suitably experienced and qualified investigator in the case of an accident, whereas it *may* choose not to do so in the case of an incident.[79] This is similar to the regime provided for aviation accidents under Part 2A of the Air Navigation Act (1920) (Cth.).[80]

The ATSB has the following powers under the Space Activities Act:

(1) the ATSB may require, by written notice, a person to attend a hearing and answer questions, which may be on oath or affirmation, or to provide any documents, records, components or equipments relevant to the investigation;[81]

(2) the ATSB may enter and search the accident site with or without the consent of the owner of the site during the "access period" as specified by the ATSB, which is to be no more than twenty-eight days unless the Australian Government approves otherwise, and take any necessary samples, photographs, video recordings and sketches;[82] and

---

[76] *Id.* § 8.
[77] *Id.* § 85.
[78] *Id.* § 86.
[79] *Id.* § 88.
[80] Air Navigation Act, No. 50 (1920) (Cth.), at Part 2A, *available at* http://scaleplus.law.gov.au/ComLaw/Management.nsf/current/bytitle/A84AE2AC0D87C338CA256F710006F002?OpenDocument&VIEW=compilations.
[81] *Id.* § 91(1)-(3).
[82] *Id.* § 100(1) and Transport Safety Investigation Act, *supra* note 19, §§ 33-36.

(3) remove the wreckage or any part thereof from the accident site.[83]

In protecting the interests of the launch operator as well as ensuring that the information obtained by the ATSB will be true and accurate, the answers and anything provided to the ATSB cannot be admitted as evidence against the provider in any legal proceedings.[84] While it is a criminal offence to refuse to answer questions or to refuse to give testimony on oath or affirmation, a person nevertheless retains the privilege against self-incrimination in that a person is not compelled to provide testimony or documents that would incriminate them.[85] As for the wreckage, it is deemed to have been taken into the ATSB's custody until no longer needed for the investigation, even if the ATSB took no steps to move the wreckage.[86]

At the end of the investigation, the ATSB is required to provide a written report of the investigation. The Space Activities Act provides that this report *may* be published if it is considered to be desirable in the interest of promoting safety in the space industry and this benefit outweighs the potential impact on the interests of the launch operator.[87] The investigation report is not admissible as evidence in an Australian court except in relation to a coronial inquiry concerning the death of an individual as a result of the accident.[88] Even if the report is published, the statements, communications, and medical or personal information collected during the investigation cannot be disclosed, unless incorporated as part of the investigation report, except by order of a court and generally only with restricted circulation for the purposes of domestic litigation in Australia.[89]

On October 30, 2001, an anomaly occurred during a HyShot rocket launch used to test an experimental supersonic-combustion ramjet (scramjet) engine built by the University of

---

[83] Space Activities Act, *supra* note 9, § 100(1)(k) and Transport Safety Investigation Act, *supra* note 19, § 36.

[84] Space Activities Act, *supra* note 9, § 91(5)-(6).

[85] *Id.* § 92(1)-(2).

[86] *Id.* § 94.

[87] *Id.* § 93.

[88] Transport Safety Investigation Act, *supra* note 19, § 27.

[89] Space Activities Act, *supra* note 9, § 96.

Queensland at Woomera, South Australia. The ATSB reported on June 18, 2002 and found that the risk hazard analysis conducted by the University of Queensland did not give sufficient allowance for the rocket vehicle malfunctioning and going off course, especially its potential impact along the Stuart Highway linking Adelaide, South Australia, to Alice Springs and Darwin in the Northern Territory.[90] Although the investigation and the resulting report were highly technical in nature, this has provided the ATSB with a much-needed opportunity to undertake an investigation concerning space activities and acquire some experience in the process.

F. Liability Issues

i. Scope of Part 4 of the *Space Activities Act 1998* (Cth)

One of the most important features of the Space Activities Act is the imposition of liability on the launch operator for damage caused to third parties, regardless of whether the damage was incurred in Australia or elsewhere. The rationale behind this is that the launch operator, and not the Australian Government, should be financially responsible for any liability incurred as a result of activities conducted by the launch operator. This is comparable with the regime imposed in the United States, which was clearly the model on which the Australian liability framework was based.

Part 4 of the Space Activities Act provides for the regulation of third party liability of the launch operator and the amount of compensation payable, provided that the damage was suffered during the "liability period" and Australia is a launching State of the space object.[91] The Part applies regardless of whether the loss or damage was suffered in Australia or elsewhere and regardless of whether the launch or return was

---

[90] Neville McMartin, *Final Report of the Investigation into the Anomaly of the Hy-Shot Rocket at Woomera, South Australia on Oct. 30, 2001*, at iv (2002), *available at* http://www.atsb.gov.au/media/36170/sir200206_001.pdf. The wreckage was located 28 kilometres east of the Stuart Highway. *Id.*

[91] Space Activities Act, *supra* note 9, § 63.

authorised under the Space Activities Act.[92] However, it is possible for third party liability to fall outside the scope of Part 4, such as where the liability is caused outside the liability period. The Space Activities Act is silent on the liability, procedure and the amount of compensation payable in such cases.

If Part 4 of the Space Activities Act applies to a particular third party liability claim, it is important to note that there is more than one avenue through which liability may be prescribed on the launch operator. This is particularly so for foreign third parties as the Liability Convention is not the only means by which the third party may seek compensation. These avenues include:

(1) Australian third parties taking proceedings in Australian courts with the liability and compensation payable determined in accordance with the Space Activities Act;

(2) foreign third parties taking proceedings in Australian courts with the liability and compensation payable determined in accordance with the Space Activities Act;

(3) Australian third parties taking common law proceedings in Australian courts;

(4) foreign third parties taking common law proceedings in Australian courts;

(5) foreign third parties taking proceedings in foreign courts in tort; and

(6) action taken by foreign governments under the Liability Convention.[93]

These options will now be considered in turn.

ii. Proceedings under the *Space Activities Act 1998* (Cth.)

The Space Activities Act imposes an absolute liability regime on launch operators in that they are liable to pay compen-

---

[92] *Id.*

[93] *See* discussion in Lee, *supra* note 22.

sation on any damage caused to a third party on Earth and to aircraft in flight during the "liability period," except where the loss or damage was caused with the intent or gross negligence of the third party.[94] However, if the damage is caused to another space object in space, the launch operator is liable only to the extent that it was the fault of the launch operator.[95] This liability regime reflects the position contained in Articles II and III of the Liability Convention and effectively implements the international principles of liability for space activities into Australian domestic law.

Provided that there was no breach of any of the conditions on the space licence or launch permit, the liability of the launch operator in proceedings brought under the Space Activities Act is limited to the insured amount as required by the Space Activities Act, which is either the MPL amount or the statutory ceiling of A$750 million.[96] In other words, a claim brought by a third party against a launch operator under the Space Activities Act must be less than the amount of the insurance cover provided to the launch operators or the claim is limited in its recovery to the insurance amount. While there are other options for foreign third parties, the ability of an Australian third party to recover more than the insurance cover would depend on the possibility of common law claims in tort, as discussed below.

iii. Tort Claims

a. Overview

One issue of particular interest to Australian space lawyers, from an international and constitutional point of view, is whether the Space Activities Act is capable of being an exclusive code concerning liability arising from launch activities. From established legal principles, it appears that the Space Activities Act cannot apply extraterritorially to the extent that it requires a foreign plaintiff to take proceedings only in Australia and only

---

[94] Space Activities Act, *supra* note 9, § 67.
[95] *Id.* § 68.
[96] *Id.* §§ 69(3) and 48(3).

under the Act and, as a result, the possibility of legal actions in foreign courts remains a source of liability for Australian launch operators. On the other hand, if a foreign third party chooses to sue in Australia, then the third party is likely to be bound by any Australian law limiting the liability of a launch operator or satellite operator. In other words, if the Space Activities Act can validly abolish tort actions by third parties in Australia, the abolition or limitation would apply equally to both Australian and foreign third parties suing in Australia, though it is likely to have no effect on limiting the rights of foreign third parties suing in foreign courts against an Australian or foreign entity.

It is unclear, however, whether the Space Activities Act in fact abolishes common law claims based on tort law in Australia. The Australian Government has signalled an intention that the Space Activities Act was intended to abolish all other third party liability in Australia, especially tort liability, for launch operators.[97] However, there are reasons why an Australian court may not give such effect. These reasons are:

(1) the Space Activities Act does not expressly specify that it intends to substitute or abolish the tort liability of launch operators;

(2) the Parliament may be considered to have done no more than to limit the amount of compensation payable rather than to abolish tort claims altogether; and

(3) Section 69(4) of the Space Activities Act lends further support to the view that the legislative intention was not to exclude tort claims.[98]

b. Legislative Intention

It may be questionable that the Parliament did intend to abolish domestic tort claims. This is because the Space Activities Act lacks the clear terms that exist in other laws concerning the abolition of common law claims. The prevailing view is that, if the Parliament intended to remove a fundamental cause of

---

[97] *Id.* § 64.
[98] *Id.* § 69(4).

action concerning a specific matter it should clearly and expressly does so, but instead the Space Activities Act makes no reference to any other civil liability for launch operators or their abolition under Part 4 of the Space Activities Act.[99] The Civil Aviation (Carriers' Liability) Act (1959) (Cth.), for example, provides in clear terms that the liability under the relevant international convention "is in substitution for any civil liability of the carrier under any other law in respect of the injury."[100]

c. Limitation on Compensation Payable

Section 64 of the Space Activities Act provides that "*Compensation* for damage to which this Part applies caused to third parties is only *payable* in accordance with this Part."[101] As the provision refers to "compensation" being "payable" rather than "claims" being "determined" or other terms of similar effect, it is arguable that the provision in the Space Activities Act does no more than to limit the liability of launch operators, regardless of how the action is brought, rather than to abolish common law actions altogether. During the parliamentary debates in the House of Representatives concerning the Space Activities Amendment Act (2002), it was stated that the Government had intended to place a cap on the liabilities of launch operators as an alternative approach to the exclusion of all common law rights altogether.[102] This statement was made by a parliamentarian sitting on the Government benches and, furthermore, was not contradicted by the relevant Minister or his Parliamentary Secretary at the time.

This may well be the preferred view that may be adopted by the courts in the event of a future claim. If the Parliament intended no more than to limit the compensation payable, an interpretation clearly open from the terms of the provisions, then the launch operator may be subject to claims brought both un-

---

[99] *Id.* § 64.

[100] Civil Aviation (Carriers' Liability) Act (1959) (Cth.), § 13, *available at* http://www.austlii.edu.au/au/legis/cth/consol_act/cala1959327/.

[101] Space Activities Act, *supra* note 9, § 64(1) (emphasis added).

[102] House of Representatives, *Official Hansard of Parliamentary Debates*, at 2349 (May 16, 2002).

der the Space Activities Act and in tort. In practice, however, a third party is unlikely to pursue the tort option as it requires the third party to prove negligence on the part of the launch operator while the compensation payable will be limited in both cases by the provisions of the Space Activities Act.[103]

d. Section 69(4) of the Space Activities Act 1998 (Cth.)

Section 69(4) of the Space Activities Act is also curious in wording, if indeed the Parliament intended to abolish domestic tort claims rather than to merely limit the amount of compensation payable. Section 69(4) provides that:

(4) If:

(a) the responsible party has paid compensation for the damage of an amount equal to the insured amount for the launch permit or overseas launch certificate; and

(b) *apart from this section*, the responsible party would be liable to pay further compensation to Australian nationals for the damage of an amount (the ***excess amount***) in excess of the insured amount for the launch permit or overseas launch certificate;

then the [Australian Government] is liable to pay compensation to the Australian nationals for the damage of an amount equal to so much of the excess amount as does not exceed $ 3 billion.[104]

If Part 4 of the Space Activities Act is intended by the Federal Parliament to be an exclusive regime concerning liability, it would appear that section 69(4) would have no operation, as there would not be any compensation payable to Australian nationals "apart from this section." However, if Part 4 merely limits the amount of compensation payable, then it is reasonable to assume that a Court may find a launch operator to be *liable* for an amount in excess of its insurance cover. In such a case, section 69(4) will have operation as the launch operator is only re-

---

[103] Space Activities Act, *supra* note 9, § 69(3).
[104] *Id.* § 69(4). Emphasis added.

quired to pay an amount equalling its insurance cover, with any excess amount up to A$3 billion to be payable by the Government if the third party is an Australian national. If the third party is a foreigner, their recovery in Australian courts will be limited to the insurance cover of the launch operator.

In sum, therefore, there appears to be some support for the view that common law actions in tort may be brought against Australian launch operators. However, unless the limitation of one year has expired before the third party began proceedings or if the damages claimed exceed the insurance cover of the launch operator, there appears to be little financial benefit to be gained for a third party to bring a claim in tort rather than pursuant to the Space Activities Act. This is especially so as the third party will be required to establish the requirements of a negligence action in tort, whereas absolute liability is prescribed in actions proceeding under the Space Activities Act.

iv. Compensation for Domestic Claims

On a practical level, the Space Activities Act effectively limits the compensation payable by launch operators but not to abolish the liability itself. As it is possible for a launch operator to be found liable for an amount exceeding the insured amount, the launch operator is only required to pay compensation equalling the insured amount. While this would be the end of the process for an action brought under the Space Activities Act, this is not the case if an Australian third party brings an action in tort. This is because section 69(4) will then have application as the Government will compensate an Australian third party up to an amount of A$3 billion in excess of the insured amount. If the excess liability exceeds A$3 billion, no further compensation is payable as the Space Activities Act effectively exonerates the launch operator or the Government from being required to pay any further compensation to an Australian third party. The reason why the Government indemnity is not available in actions brought under the Space Activities Act is because the liability would not have arisen "apart from this Section." being Section 69 of the Space Activities Act.

Where a foreign third party brings a tort claim in Australia or overseas, the governmental contribution provided under the Space Activities Act is not available as it applies only to liability of the launch operator to Australian nationals.[105] Consequently, in the case of a claim brought overseas, the launch operator is liable for the entire amount awarded to the foreign third party, subject to its ability to call on its insurance cover for at least part, if not all, of the compensation awarded. If the foreign third party brings proceedings in Australia, however, the Space Activities Act will have application to limit the launch operator's liability and the total compensation that may be received by the third party to the insured amount, regardless of whether the action was framed in tort or pursuant to the Act. As a result, it may be more beneficial for a foreign third party to bring proceedings in its domestic courts concerning large claims, if possible, to maximise the compensation payable.

v. Claims under the Liability Convention

The Liability Convention provides that a State may bring a claim against Australia where the State or one of its nationals has suffered injury, loss or damage caused by a space object for which Australia is a launching State.[106] The Liability Convention also provides for a claim to be negotiated through diplomatic channels between the governments and, in the event that negotiations fail to resolve the claim, a Claims Commission is to be established to determine the claim.[107] While the Liability Convention does not require the exhaustion of local remedies before bringing a claim, it does prevent a claim to be brought when domestic proceedings have already begun.[108] In other words, a foreign third party may take action privately in domestic courts or to promote its government to take up its claim through the Liability Convention, but not both.

---

[105] Space Activities Act, *supra* note 9, § 69(3).
[106] Liability Convention, *supra* note 62, at art. VIII.
[107] *Id.* at art. IX.
[108] *Id.* at art. XI(2).

The Space Activities Act provides that the launch operator is liable to reimburse the Australian Government for the full amount of the compensation or the insurance amount, whichever is lower, provided that the launch was authorised and fully compliant with the conditions of the relevant space licence and launch permit.[109] As liability under the Liability Convention is imposed on the Australian Government, this effectively means that the Government would pay any amount in excess of the insurance amount claimed by the foreign government.

vi. Liability Outside the Scope of Part 4

The liability concerning any damage arising outside the liability period is very different to that for damage incurred within the liability period. Essentially, the Space Activities Act is silent on the liability arising outside the liability period, leaving the common law or international law to determine the liability and the compensation payable of the launch operator, the payload owner or the Australian Government.

The term "liability period" means the period of thirty days from the launch or from a relevant re-entry manoeuvre to the time when the space object comes to rest on Earth.[110] With this in mind, it appears that there are several scenarios for damage to be caused outside this liability period, including (but not limited to):

(1) damage caused by remnants of the launch vehicle over thirty days after its launch, such as the re-entry of a third stage rocket colliding with an aircraft in flight; or

(2) damage caused by the payload carried by the launch vehicle over thirty days after its launch, such as a collision with another satellite.

Where an Australian third party suffers the damage, that third party will have recourse against either the launch operator or the payload owner in common law. The procedures and

---

[109] Space Activities Act, *supra* note 9, § 74(2).
[110] *Id.* § 8.

limitations imposed under the Space Activities Act will have no application on such claims as Part 4 is confined in its scope to liability caused within the liability period.[111] The choice of the appropriate defendant in such a claim may depend on several factors, the most important of which would be the degree of fault or negligence. Other factors would likely include the insurance cover, financial support, fault, or negligence and the location of the launch operator or payload owner.

If a foreign third party suffers the damage outside the liability period, Australia will be liable as a launching State for the purposes of the Liability Convention.[112] The foreign third party would have several options:

(1) the third party may choose to sue in Australian domestic courts against the launch operator, in which case the claim will be determined in accordance with common law principles of tort and the damages that may be payable would be unlimited;

(2) the third party may choose to sue in foreign courts against the Australian launch operator, subject to various jurisdiction and enforcement issues, and the claim will be determined in accordance with the local principles of tort and the damages that may be payable would again be unlimited; or

(3) the national government of the third party may choose to pursue a claim against the Australian Government in accordance with the Liability Convention, in which case the Australian Government, and not the private operator, would be liable in accordance with articles II and III of the Liability Convention. It is unclear whether the Australian Government will have recourse against the launch operator in such case, though it is unlikely in the absence of any legislative provision to permit it.

While the concept of the liability period was designed to limit the liability exposure of Australian launch operators, it appears somewhat strange that the Space Activities Act would

---

[111] *Id.* § 63.

[112] Liability Convention, *supra* note 62, at art. I.

fail to provide any protection to the launch operator in the case of liability falling outside the liability period. As it currently stands, a prudent launch operator would ensure that its insurance cover extends for a period sufficiently long for the third or fourth stages of the launch vehicle to pose no threat to any third party. Consequently, without legislative change to provide for some form of governmental indemnity, this effectively negates any financial or competitive advantage an Australian launch operator may have vis-à-vis foreign launch operators.

G. Suggested Changes to the Australian Law

i. Statutory Ceiling on Insurance Cover

Some concerns remain within the Australian launch industry relating to the statutory ceiling on the insurance cover for launch operators as required under the Space Activities Act. The Senate Economics Legislation Committee noted recently that the statutory ceiling on the insurance cover provided under the Space Activities Act exceeds the ceilings imposed in other States (except for the Russian Federation and the United States), especially considering the Australian requirement to have a flight path that avoids any high-value designated assets or protected assets.[113] On the other hand, the Australian Petroleum Production and Exploration Association (APPEA) argued that the potential high costs associated with any damage caused by space launches meant that the insurance cap artificially lowers the risk borne by launch operators, as liability under the Space Activities Act is capped at the corresponding insurance cover.[114]

It does appear, however, that this ceiling is unlikely to change except for the purpose of indexation, as the launch industry is unlikely to accept a higher exposure to liability than it does presently under the Space Activities Act.

---

[113] Senate Economics Legislation Committee, *supra* note 47, ¶ 1.18. It was noted that the insurance ceilings imposed by other States are: US$ 100 million for China, US$ 53 million for France, US$ 200 million for Japan and US$ 500 million for Russia and the United States.

[114] *Id.* ¶ 1.21.

ii. Common Law Actions by Third Parties

Confusion remains over the effect of the Space Activities Act on potential common law tort claims brought by Australian and foreign third parties in Australia. One of the current Australian launch operators suggested to the Senate Economics Legislation Committee that the Space Activities Act leaves open the possibility of tort actions in common law.[115] The Government's response was that the liability limitation provided in the Space Activities Act means that immunity is available to launch operators for liability in excess of the insurance cover.[116] The Government appears not to appreciate the fact that a foreign third party may bring claims in foreign domestic courts instead of the Liability Convention and the Space Activities Act does not provide for any protection, such as an indemnity, to the launch operator in such cases. Further, the possibility of common law claims also allow a third party to begin proceedings outside the time period of one year provided under the Space Activities Act, provided that the action is brought within any time limit imposed by an applicable statute of time limitations.

iii. Governmental Indemnity for Common Law Claims

In common law actions brought by Australian nationals, the governmental contribution of $3 billion in respect of claims brought in excess of the insurance cover is widely considered to be too low.[117] In the submissions made to the Senate Economics Legislation Committee, this view is shared by the launch industry as well as the APPEA. This is particularly the case considering this contribution is not provided in claims brought by foreign third parties or a claim brought pursuant to the Space Activities Act rather than in common law.

It has also been noted that the Australian Government's contribution of A$3 billion to any common law liability of the launch operator does not specify whether or not the indemnity relates to any one incident and whether or not the Government

---

[115] *Id.* ¶ 1.32.
[116] *Id.* ¶ 1.33, referring to Space Activities Act, *supra* note 9, § 69(3).
[117] *Id.*

is exposed to an indemnity in a case where there are multiple third party claimants.[118] As this has the potential of seriously affecting the potential liability of launch operators, this is an issue that should be clarified in any future amendments to the Space Activities Act.

iv. Claims Outside the Liability Period

The Space Activities Act does not provide any protection for launch operators in the event of damage caused outside the "liability period," as defined in the Act, for a launch. If the governmental intention of reducing and limiting the liability of launch operators is to be given effect, the Space Activities Act should either provide for a blanket indemnity for damage caused outside the liability period, regardless of how or where the proceedings are brought, or to effectively and validly abolish any tort actions relating to such damage caused outside the liability period.

v. Indemnity for Foreign Private Claims

Given that the Space Activities Act is unlikely to be able to prevent foreign private claims made against the launch operator, the Act does not address this issue nor does it protect the launch operator with any financial indemnity. It appears that the Government may not have considered this possibility and assumed that all foreign claims would be made through the Liability Convention. In order to be consistent in protecting the potential liability of the launch industry, the Space Activities Act should extend the governmental indemnity in the case of private claims for both Australian and foreign third parties, regardless of where the proceedings are brought.

The simplest solution may well be to extend the indemnity provided under section 69(4) of the Space Activities Act to foreign nationals and foreign claims, as a foreign private proceed-

[118] House of Representatives, *Official Hansard of Parliamentary Debates*, p. 2350 (May 16, 2002).

ing would be a liability arising "apart from this section," being section 69 of the Act.

II. RELEVANCE OF AUSTRALIAN SPACE LAW IN THE PACIFIC RIM

A. Extraterritorial Operation of the Australian Laws

It is notable that the Space Activities Act, by its very nature and licensing provisions, has an element of extraterritorial application. The statute applies to activities conducted by Australian nationals outside Australia. The extraterritoriality of these national space laws stem from the very international obligations that they seek to implement, namely the provisions of the Outer Space Treaty and the Liability Convention in the case of the Space Activities Act. Consequently, one may expect that the national space laws of other States, including those in the Pacific Rim region, would have similar scope and need for extraterritorial application.[119]

The extraterritorial operation of national space laws have the potential effect of requiring multiple licensing requirements to be imposed on a multinational firm. For example, a Hong Kong national procuring the launch of a space object from Australia would be subject to regulation and licensing under both the Outer Space Ordinance of Hong Kong and the Space Activities Act of Australia. The burden imposed by the multiplicity of national laws licensing space activities may cause private space ventures to go "forum shopping" or to consider their corporate structure in a manner that most alleviates their regulatory difficulties. The multinational Sea Launch Company LLC is one of the more notable examples of where the possible licensing requirements under both the national space laws of the United Kingdom and the United States have led to it relocating itself to the United States from the Cayman Islands, a Crown colony of the United Kingdom.[120]

---

[119] *See e.g.*, Outer Space Ordinance, (1999) Cap. 523, § 3. (H.K.), *available at* http://www.hklii.org/hk/legis/en/ord/523/ (the Outer Space Ordinance of Hong Kong applies to space activities "whether carried on in Hong Kong or elsewhere").

[120] Sea Launch Company LLC was required to obtain a launch licence under both the Commercial Space Launch Act of the United States, under which the Boeing Company

Consequently, when considering the licensing and other regulatory requirements imposed on a multinational launch service provider or satellite operator, it is important to consider the licensing requirements under the national space laws of all States that may have extraterritorial application to the private entity. In the context of Australian law, where there may be a jurisdictional connection between Australia and the relevant entity or activity, the potential application of the national space laws of Australia will need to be evaluated and considered. These considerations may have a serious impact in the ownership and corporate structure of the private venture as well as the nature of the space activity as contemplated.

B. Benefits of Harmonisation and Reciprocal Recognition in the Regulation of Multinational Private Space Activities

As regional and international strategies that may be deployed to combat the problems of having multiple licensing requirements and the disadvantages of forum shopping, at least two of the more viable methods of alleviating the problems would be to harmonise the important provisions of the domestic laws concerning space activities, such as the financial responsibility and insurance requirements, and the provide for reciprocal recognition of the more onerous elements of the technical regulation of space activities, such as launch safety and risk certifications of launch vehicles or the qualifications of relevant technical staff.

The conceptual benefits that may be derived from harmonisation of important regulatory provisions are abundantly clear.[121] If the regulatory burden imposed by the domestic laws regulating space activities is equivalent or at least similar between different States, the advantages that may be derived

---

was considered to have a "controlling interest" in Sea Launch Company LLC, as well as the Outer Space Act of the United Kingdom, which by the force and effect of the Outer Space Act (Cayman Islands) Order 1998 (U.K.) applies to the Cayman Islands. *See Legal and Policy Aspects of Launch Services*, *supra* note 2; and Press Release, Sea Launch Company LLC, Sea Launch Moves Partnership Headquarters to Long Beach (Apr. 13, 2000), *available at* http://www.boeing.com/special/sea-launch/news_releases/2000/nr_000413.html.

[121] *See Legal and Policy Aspects of Launch Services*, *supra* note 2.

from forum shopping would be significantly reduced. Further, steps toward harmonisation would reduce the degree of uncertainty and opacity involved in the regulation of private space activities, enabling easier access to substantial finance and increasing international trade in space-related services. The intergovernmental negotiations in relation to harmonisation would also have the incidental benefit of increasing cooperation in the field of space activities, which is a particularly fruitful benefit in a region such as the Pacific Rim where such cooperation is somewhat lacking.

In addition or as an alternative to harmonisation of regulatory provisions, reciprocal recognition of licensing and certification of launch facilities, launch vehicles, and technical expertise of personnel would greatly reduce the regulatory compliance costs of private space ventures that seek to import into one State the whole or part of a launch facility or launch vehicle that has been certified or licensed for the same type of space activities in another State. For example, the Space Activities Regulations reduces the compliance costs and regulatory burden in relation to the certification or licensing of a launch facility or a launch vehicle in Australia where a "technical recognition instrument" is in force with the effect that the Australian Government would recognise the licensing or certification granted in another State.[122] Such initiatives, if adopted by more States on a reciprocal basis, would greatly reduce the regulatory burden imposed by States with onerous licensing and certification requirements on private launch service providers seeking to conduct launch activities in a State other than the State where the launch facility or launch vehicle was manufactured and originally licensed.

---

[122] Space Activities Regulations, *supra* note 17, § 2.06(8). What was contemplated was the future existence of technical recognition instruments between Australia and Russia that would enable the former to recognize the licensing and certification of launch facilities and launch vehicles of the latter.

C. Trade Restrictions Imposed on Space Technologies

In the United States, the Arms Export Control Act (1976) (U.S.) and the International Traffic in Arms Regulations (ITAR) effectively provide that satellites, including electronic equipment specifically designed or modified for spacecraft or spaceflight, are on the U.S. Munitions List and thus may not be exported for launch without governmental approval.[123] Complemented at an international level by the implementation of the Wassenaar Agreement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies[124] and the Missile Technology Control Regime (MTCR), these arrangements have a significant impact on the provision of commercial launch services by States such as Australia, China, and India to the United States.[125]

In Australia, those export controls required under the Wassenaar Agreement and the MTCR are implemented under the Customs Act 1901 (Cth.).[126] Part 1 of the Defence and Strategic Goods List directly implements the Munitions List contained in the Wassenaar Agreement. Part 3 of the Defence and Strategic Goods List implements the Dual Use Goods and Technologies List contained in the Wassenaar Agreement and the items in the MTCR Annex.

In the context of considering the regulatory impact of the national laws of Australia on multinational private space activities, it is important to consider the impact of domestic and international export controls on items containing restricted space technologies. This is because export controls have a significant impact on the ability of a launch service provider, satellite manufacturer, or satellite operator to provide some services to

---

[123] H. PETER VAN FENEMA, THE INTERNATIONAL TRADE IN LAUNCH SERVICES: THE EFFECT OF U.S. LAWS, POLICIES AND PRACTICES ON ITS DEVELOPMENT at 112-114 (1999).

[124] Wassenaar Arrangement, *supra* note 18.

[125] *See* discussion in Van Fenema, *supra* note 123, at 110-181; and Steven R. Freeland and Ricky J. Lee, *The Impact of Arms Limitation Agreements and Export Control Regulations on Launch Activities*, 45 PROC. COLL. L. OUTER SPACE 321 (2002).

[126] Customs Act, 1901, § 112 (Cth.), *available at* http://www.austlii.edu.au/au/legis/cth/consol_act/ca1901124/. *See also generally* the Customs (Prohibited Exports) Regulations, 1958, (Cth.), *available at* http://www.austlii.edu.au/au/legis/cth/consol_reg/cer1958439/.

customers in States that may be subject to export restrictions, including those in the Pacific Rim region.

D. Australian Laws as Models for Other Pacific Rim States

Reflecting on the objectives of the Space Activities Act, there is no reasonable doubt that the Australian Government has succeeded in instituting a comprehensive regulatory framework for private space activities. In recent years, there is a clear trend towards more complex regulation of private launch activities in the domestic laws of States that were being enacted, from the early and somewhat simplistic national laws found in Norway and Sweden in 1969 and 1982, respectively, to the more recent and complex national laws found in the United States and Australia in 1984 and 1998, respectively.

In particular, with a regulatory framework focused primarily on private and multinational space launch activities, the Space Activities Act may serve as a useful model for other States, particularly in the Pacific Rim region, that are considering the enactment of their own national laws that would adequately implement their international obligations under the relevant treaties as well as to sufficiently pass onto the private sector the international liability and responsibility arising from these treaties. It can be expected that, as the commercial space launch industry become increasingly privatised and multinational in nature in the future, the need for domestic regulation of space activities will only increase over time. In the absence of internationally negotiated model laws, the Space Activities Act may well be a useful reference for States seeking to enact their own regulations.

III. CONCLUDING OBSERVATIONS

Many commentators have observed or predicted a continuing shift of political, economic, and technological power from the Transatlantic to the Pacific Rim in the present century.[127] It is

---

[127] *See*, *e.g.*, James A. Baker III, *America in Asia: Emerging Architecture for a Pacific Community*, 70(5) FOREIGN AFFS. 1 (1992); STAFFAN BURENSTAM LINDER, THE PACIFIC CENTURY: ECONOMIC AND POLITICAL CONSEQUENCES OF ASIAN-PACIFIC DYNAMISM

only reasonable to expect that such a shift would have an impact on the increasingly multinational and gradually privatising space industry. Due to the need to implement the international obligations of States under the relevant international treaties and regulatory instruments, the enactment of domestic laws dealing with space activities is an important precondition to the emergence of a vibrant regional space industry in the Pacific Rim.

In this context, the development of domestic laws in Australia dealing with space activities have demonstrated the potential complexity of the regulatory frameworks in balancing the needs of States to encourage foreign investment and trade in space-related services, to ensure compliance with international and regional obligations, as well as to protect the national governments from exposure to international liability. It is through an adequate balance between these interests that enables Australia to adopt a regulatory regime that may prove to be advantageous in the future evolution and development of the space industry in the Pacific Rim.

(1986); Thomas Brosch and Brian H. Kleiner, *The Growing Business Power of the Pacific Rim*, 24 MAN. RES. NEWS 141 (2001); JOHN RAVENHILL, APEC AND THE CONSTRUCTION OF PACIFIC RIM REGIONALISM (2002); and DEREK MCDOUGALL, ASIA PACIFIC IN WORLD POLITICS (2007).

CURRENT STATUS AND RECENT DEVELOPMENTS IN CANADA'S NATIONAL SPACE LAW AND ITS RELEVANCE TO PACIFIC RIM SPACE LAW AND ACTIVITIES

Bruce Mann[*]

There have been no legislative changes in Canada's national space law[1] over the last couple of years, nor has there been any space law jurisprudence. However, a couple of unusual satellite licensing situations in Canada will be of particular interest to Pacific Rim countries, as will an analysis of Canada's legislated capacity to implement space debris mitigation guidelines.

I. MARITIME TRAFFIC INFORMATION FROM REMOTE SENSING SATELLITES

In April 2009, the Canadian space hardware designer and manufacturer COM DEV International Ltd. announced[2] that it had successfully completed testing of a satellite to be used in a high performance maritime Automatic Identification System (AIS) capable of receiving and de-colliding AIS signals from thousands of ships around the world, including busy shipping lanes such as the Pacific Rim's Malaca Straits. A subsidiary, exactEarth Ltd.,[3] was created in June 2009 to provide detailed near real time data about ship traffic to customers worldwide, using a constellation of satellites to be built and placed in orbit over the next few years.

---

[*] Senior Counsel, Justice Legal Services Division, Department of Foreign Affairs and International Trade, Ottawa, Canada. The opinions in this paper are his own and do not necessarily reflect the views of the Government of Canada.

[1] Remote Sensing Space Systems Act, 2005 S.C., ch. 45 (Can.) [hereinafter RSSSA].

[2] Press Release, Com Dev Int'l, Com Dev Successfully Demonstrates Advanced Space-Based AIS Technology, (Apr. 28, 2009), http://micro.newswire.ca/release.cgi?rkey=1704286079&view=28380-0&Start=10&htm=0 [hereinafter Com Dev Int'l].

[3] exactEarth Ltd., http://www.exactearth.com/about-us.aspx (last visited Nov. 25, 2009).