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SPACE LAW DEVELOPMENTS IN ASIA-PACIFIC:
DIVERGING NATIONAL SPACE LEGISLATION WITH
REGARD TO THE APPLICABILITY OF SPACE LAW TO
SUBORBITAL FLIGHTS

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Keeping Up with the Neighbours?

Reviewing National Space Laws to Account for New Technology – The Australian and Canadian Experience

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Abstract

The development of space-related technology since the dawn of the space age in 1957 has given rise to many new and exciting possibilities. It has also meant that space activities continue to evolve, facilitating the participation of a variety of space 'actors' other than States. Given the international responsibility of States for 'national activities in outer space' under both customary international law and the Outer Space Treaty, there is an imperative for States to enact relevant and contemporary national space law to regulate those non-governmental space actors within their respective jurisdiction. But enacting national space law is not enough – as the paradigm of space-related technology changes and evolves, it is clear that such shifts require the ongoing review of appropriate national regulatory standards over relatively short timeframes. National legislatures have to come to grips with the ever-changing range of space technology, particularly if they wish to become increasingly involved in space activities. Whatever rules are put in place during the review process must find the right balance between, on the one hand, the need for regulation of the economic and technical elements, so as to minimise the risks to an acceptable level, and the facilitation of research and innovation to allow for greater and more efficient access to space, and the potential for commercial returns, on the other. This paper will describe this process of review and rejuvenation of existing national space laws in both Australia and Canada, outlining the relevant factors that were taken into account in order to maximise the utility of the regulations to meet the specific goals and requirements within each country.

1. Introduction – The Need for Legislative Reform

It has been almost 60 years since, on 4 October 1957, the Soviet Union successfully launched the first human-made space object to orbit the Earth (Sputnik 1). The period since that time has seen the continuous and seemingly

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endless development of space-related technology. As a direct consequence of this evolution in the design, implementation and application of space technology, humankind is now engaged in a multitude of space activities far beyond the contemplation of anyone involved with space in those early days. The utilisation of space-related technology represents a crucial aspect of contemporary society in all parts of the globe – irrespective of the prevailing economic and technical characteristics of any particular country.

The ongoing development of this technology continues today and encompasses a range of multi-faceted factors. Space-related technology has facilitated significant improvements in the standard of living for all humanity. It also has a far greater influence upon the normal functioning of societies than one might at first instance imagine. Several widely reported studies and simulations have demonstrated the very significant economic and natural security implications of a ‘day without space’.¹ It is apparent that space, and its utilisation, has become an increasingly important domain incorporating many political, legal, scientific, economic and humanitarian considerations. The conduct of our daily lives would in many respects be dramatically curtailed without constant and unimpeded access to space-related technology, and this imperative is likely to become even more pronounced for future generations. This has primarily been driven by the increasing ‘commercialisation’ of outer space.

Yet, despite all of these developments, it is clear that the existing international legal and regulatory regime in relation to the exploration and use of outer space has not kept pace with the remarkable technological and commercial progress of space activities since 1957. This represents a major challenge in relation to the ongoing development of effective legal principles, all the more so in view of the strategic and military potential of outer space in an era of globalization.²

What is also evident is that the range of entities engaged in the ever-broadening scope of space activities is itself becoming increasingly diverse. Whereas once outer space was for all practical purposes the realm solely of States and Governments, the situation has changed dramatically in this regard, with many non-governmental (private) entities now actively involved

1 See, for example, The Marshall Institute, ‘A Day without Space: Economic and National Security Ramifications: 16 October 2008: <http://marshall.org/space-policy-tags/day-without-space/>; Stew Magnuson, ‘U.S. Forces Prepare for a ‘Day without Space’, National Defense Magazine, February 2014: www.nationaldefensemagazine.org/archive/2014/February/Pages/USForcesPreparefora%E2%80%98DayWithoutSpace%E2%80%99.aspx.

2 For a discussion of the challenges posed by changing space-related technology to the existing international legal framework, see, for example, Steven Freeland, ‘A Delicate Balance: Regulating Micro Satellite Technology in a Big Satellite World’ (2014-2015) 18:1 *University of Western Sydney Law Review* 1.

in different activities in outer space. It is to be anticipated that this trend will continue.

This has led to an imperative towards the development of national space law to complement the existing – and future – international legal regime for the exploration and use of outer space.³ Somewhat ironically, therefore, the pace of development of national space law now surpasses that of international space law, despite the legal characterization of outer space as a non-sovereign area. This is notwithstanding the fact that the international principles themselves may require further development as humankind's endeavours in outer space continue to evolve, for example in relation the future exploitation of the natural resources of the moon and other celestial bodies.⁴

Over recent years, therefore, an increasing body of domestic law dealing specifically with space-related activities in various countries has been developed, in order to more effectively regulate the space activities of private and semi-private entities that are engaged in space activities, although such legislation can (and sometimes does) also apply to State activities. As a broad observation, while some of the earlier examples of national space legislation were quite generalized in their terms and allowed the State wide discretionary powers in the application of the regulatory rules, in more recent times, these laws have tended to be more comprehensive, specific and 'legalistic'.⁵

This is largely due to an increasing awareness among drafters of the significance of the national space legislation as a way of addressing the wide range of space activities that are now being undertaken, including the advent of very significant commercial space activities. It also recognises the commercial need for clarity and certainty on the part of non-governmental entities that are considering the allocation of very significant resources towards undertaking an outer space activity.

This also means that the structure and precise terms of the different national space laws that have thus far been enacted vary quite significantly. Moreover, whereas in most countries, the national space law has been incorporated into one piece of legislation, in the United States, there is instead a body of separate legislation, each of which addresses different forms of space

3 For an outline of the issues that are typically addressed in national space legislation, see Steven Freeland, 'The Development of National Space Law' in Steven Freeland, Rada Popova and Solomon Passy (eds), *Contemporary Issues for National and International Space Law: Commentary and Source Materials*, 12 (2012).

4 See generally the Moon Agreement, which is designed to provide for the future establishment of an 'international regime. ... to govern the exploitation of the natural resources of the moon [and other celestial bodies] as such exploitation is about to become feasible': Moon Agreement, article 11 (5).

5 See also, European Space Policy Institute, Matxalen Sánchez Aranzamendi, 'Economic and Policy Aspects of Space Regulations in Europe' (Part I), 21 September 2009, page 4.

activities, such as communication satellites, remote sensing and commercial launches.

In addition, there may be specific national laws that relate to a diverse range of other issues – for example, national security, environmental protection, export controls – that will also be of relevance in the overall regulation of national space activities. Whilst it is clear that the precise terms of any domestic law fall to be determined by issues of sovereignty and the internal constitutional and administrative requirements of the relevant State – not to mention, of course, its particular economic, political, developmental, societal and cultural situation – there are a number of elements that *ceteris paribus* would typically form a basis for most national legislation dealing with activities in outer space.

Yet, all countries with existing, or contemplating future, national space laws face a common question – ‘how do regulators find the right balance between, on the one hand, the need to comply with international obligations and standards as well as managing financial risks and, on the other, proper adaptation to the rapidly developing space-related technology landscape and the need to construct ‘enabling’ regulatory frameworks that encourage entrepreneurship, innovation and commercial opportunities?’ Overlaying these complex factors is the undeniable relevance of the various national security considerations that arise from the utilisation of space technology.

Many countries are therefore reflecting on the right regulatory pathway to suit their unique national environment, situated within the broader international framework. This paper provides a brief update on progress in two industrialised countries – Australia and Canada – in reforming their national laws to be more appropriate for the (constantly) changing technical paradigms that underpin the use of outer space.

2. Australia and Space⁶

Australia has had a long heritage in space-related activities and has made several significant contributions from the early development of humankind’s endeavours in space. Its technical expertise, geographic location and long and close alliances with various other space-faring countries, has meant that it has played, and continues to play, an important role in tracking and communications activities involving all manner of space objects. In addition, as early as 1949, a test launch facility was developed at a site in Woomera in South Australia that, at its peak, was the world’s second most heavily used launch site (after Cape Canaveral), involving the launch of American, European and Australian rockets.

6 For further details of Australia’s history with respect to space-related activities, see Steven Freeland, ‘Australia and International Space Law’ in Donald R Rothwell and Emily Crawford (eds), *International Law in Australia* (3rd ed), 507 (2017).

Australia has also been actively involved in the development of the international legal framework for outer space. It was a foundation member State of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS).⁷ Its active international diplomatic engagement with space continues to the present day, with Australia also regularly participating in inter-governmental and other multilateral / bilateral discussions regarding many aspects of space activities.

Yet, notwithstanding these achievements, there has historically been a general view that Australia's position as a major space participant has probably decreased over recent decades. In an OECD 2014 Report,⁸ Australia was not included in the OECD's profile of 'Actors in the Space Economy'. The OECD 2014 Report also notes that 'Business Enterprise R&D' ('BERD') in the aerospace sector in 2012 in Australia was at the lowest end of the spectrum, at less than 1 per cent of total BERD for the country (page 94).

Nevertheless, it is clear that space plays an integral part in many aspects of the day-to-day functioning of the country. Like most (industrialised) countries, Australia is highly dependent on continuing and cost effective access to satellite data, including the following:⁹

- “1. Position, navigation and timing data is becoming increasingly central to personal navigation and planning, and the ongoing economic productivity and security of industry sectors such as transport, logistics, mining and agriculture.
2. Earth observation data help us understand weather predictions, droughts, forest fires, urban development, and future social planning needs.
3. Satellite communications technologies, including broadband, enable Australian citizens and companies to conduct essential business and access critical services such as emergency transport.”

Australia is therefore reliant upon space-related technology for a wide variety of activities that contribute to the broader national economy, as well as the operation of infrastructure and the major workings of everyday life. Space-related products and services are utilized in virtually every sector of the

7 Australia was one of 18 countries that were members of an *ad hoc* Committee on the Peaceful Uses of Outer Space, established in 1958 to consider and report on various issues relating to the peaceful exploration and use of outer space; see United Nations General Assembly Resolution 1348 (XIII) (1958): www.unoosa.org/pdf/gares/ARES_13_1348E.pdf. In the following year, this *ad hoc* Committee was converted into a permanent body, UNCOPUOS, of which Australia was a foundation member; see United Nations General Assembly Resolution 1472 (XIV) (1959): www.unoosa.org/pdf/gares/ARES_14_1472E.pdf.

8 OECD, 'The Space Economy at a Glance 2014', November 2014: www.oecd-ilibrary.org/economics/the-space-economy-at-a-glance-2014_9789264217294-en.

9 Department of Industry, Innovation and Science, 'Australian Civil Space': www.industry.gov.au/INDUSTRY/IndustrySectors/SPACE/Pages/default.aspx.

Australian economy, and the associated technology supports many important areas closely aligned with the country's national interests.

The experience of other countries has been that the development of a robust indigenous capability in areas related to space technology potentially has multiple benefits, and has supported innovation, skills and capability development. These are important components for an industrialised economy like Australia, and will help to position it to meet the undoubted technological challenges and increasingly competitive international environment that are likely to be features of the 21st century.

2.1 The Australian Space Economy

As noted, not only is Australia highly dependent upon access to space-related technology and space data but, in common with other major industrialised countries, its private and research sectors are actively engaged in many areas associated with space-related industries. In addition, Australian universities are engaged in leading-edge space science research.

The direct involvement by Australian private entities and research institutions in the development and application of space-related technology also contributes to the Australian space economy. Equally significant, however, are the upstream and downstream impacts that these activities have for other sectors of the broader Australian economy. The development of space-related technology also facilitated innovation in other sectors. There are significant direct applications and spinoffs from this technology that have positive impacts and provide support not only for core industries within the Australian economy, but also for a range of associated industries.

These include quantifiable financial benefits to the economy, both in terms of direct involvement, as well as broader current and future opportunities for Australian entities. A 2015 report by independent consultants concluded that:¹⁰

- “1. Annual revenue generated by the Australian space industry was estimated to be between AU\$ 3-4 billion.
2. Employment in the total Australian space industry was estimated to be between 9,500 and 11,500 full-time equivalent staff.”

The state of the Australian space economy is also to be considered within the broader context of the overall national economy. The Government had noted that significant potential existed for space technologies to play a role in facilitating a transition of the economy in circumstances where the regulatory

10 Asia Pacific Aerospace Consultants Pty Ltd, 'A Selective Review of Australian Space Capabilities: Growth Opportunities in Global Supply Chains and Space Enabled Services' (2015): www.industry.gov.au/industry/IndustrySectors/space/Documents/APAC%20Report%20on%20Australia%20Space%20Capabilities%20Revised.pdf (APAC 2015 Report).

environment is appropriately conducive to private investment in the space sector.

It is important, therefore, to recognise that the regulatory framework under which the space industry operates is one factor that impacts upon the potential for the sector to contribute positively to a national economy. For a number of years, many stakeholders in Australia had argued that this contribution could become significantly greater over time, but that the existing Australian legislative framework for civil space, which centred on legislation that was almost two decades old, the 1998 Space Activities Act and its associated Regulations,¹¹ did not currently provide the appropriate regulatory environment for these potential benefits to be maximised. As a consequence, the Government has initiated various processes of legislative reform.

2.2 Process of Legislative Reform – Australia

2.2.a Review of the 1998 Space Activities Act

On 24 October 2015, the (then) Minister, The Hon. Christopher Pyne MP, announced that the Department of Industry, Innovation and Science would conduct a staged review of the Act, incorporating consultation with governments, researchers, industry and the public.¹² The review was conducted with the assistance of Professor Steven Freeland from Western Sydney University.

The Terms of Reference of this review were as follows:

“The Review of the Space Activities Act 1998 will examine the appropriateness and effectiveness of existing Australian civil space regulation, including whether the Space Activities Act 1998:

1. Supports innovation and the advancement of space technologies;
2. Promotes entrepreneurship and private investment in Australia, as well as opportunities for Australian firms to compete globally into the future;
3. Appropriately protects the Commonwealth against potential liability claims in relation to current and future civil space activities conducted in Australia or by Australians;
4. Adequately addresses emerging issues such as management of the space environment and technology advancement or convergence;

11 For details of the Space Activities Act 1998, see Steven Freeland, ‘Sensing a Change? The Re-Launch of Australia’s Space Policy and Some Possible Legal Implications’ (2010) 36:2 *Journal of Space Law* 381; Steven Freeland, ‘When Laws are Not Enough – the Stalled Development of an Australian Space Launch Industry’ (2004) 8 *University of Western Sydney Law Journal* 79.

12 See Minister for Industry, Innovation and Science, The Hon. Christopher Pyne MP, ‘Atmosphere is right for a review of our space activities’, 24 October 2015: <http://minister.industry.gov.au/ministers/pyne/media-releases/atmosphere-right-review-our-space-activities>.

5. Appropriately aligns with other related Australian legislation and/or Australia's international obligations, and removes unnecessary regulatory burden;
6. Provides the necessary authority to support Commonwealth led civil space activities (government only)."

Consultations, including over 70 written public submissions, took place between October 2015 and April 2016, and a 180-page report, with a series of recommendations/options for Government was submitted by Professor Freeland to the Government at the end of August 2016 (Freeland Report).¹³

These recommendations/options for Government centred on the desirability of reducing both the administrative and bureaucratic aspects of licence application, as well as the financial costs associated with it, particularly taking into account that, due to the changing nature of space-technology in the Australian sector, those seeking a licence to engage in a space activity would not necessarily have the ability to provide the then required level of financial comfort to the Government to cover its contingent liability under the Liability Convention. In addition, other suggestions to broaden and 'commercialise' the scope of the legislation were put forward.

2.2.b Reform of the Legislative Framework

Following the submission of the Freeland Report, the Government undertook a further series of internal discussions and, in March 2017, published an Issues Paper in which it summarised the findings of the review and put forward a series of reforms of the national legislative framework for civil space activities. Essentially it had shifted its thinking from an amendment to the existing legislation (the 1998 Space Activities Act) to the development of new legislation to replace and 'upgrade' the framework. Among the reforms that were being contemplated were the following:¹⁴

- “1. That the objects of the legislation be streamlined, to emphasise appropriately balancing risk and Australian benefit, including a focus on Australia's international obligations and the establishment of a system of regulation for those activities;
2. That a licence type to authorise payloads be introduced;
3. That requirements currently outlined in the Space Activities Regulations 2001, which are more relevant to launch rather than establishment of a launch facility, be transferred to the proposed new 'Australian launch permit' licence;
4. That a high level statement committing applicants to consider the space environment be considered. Detail on how this might be achieved may be

13 A copy of this report is *available upon request by emailing* space@industry.gov.au or from the author directly at s.freeland@westernsydney.edu.au.

14 See Department of Industry, Innovation and Science, <https://www.industry.gov.au/industry/IndustrySectors/space/Pages/Review-of-the-Space-Activities-Act-1998.aspx>.

provided in guidance material or a subordinate instrument. The ability for the Minister to provide exemption from this requirement is also proposed;

5. Proposals for possible changes in relation to fees and insurance.

This process attracted a small number of further public written submissions and, as this paper is being written, it has been noted by the Government that a draft Bill is being prepared for further public consultation and discussion. No indication has as yet been given as to when this draft might be circulated publicly.

2.2.c Review of Australia's Space Industry Capability

On 13 July 2017, the Australian Government announced a review of Australia's space industry capability with a goal of allowing the country 'to capitalise on the increasing opportunities within the global space industry sector'. An Expert Reference Group (ERG) was established to undertake this review, which commenced on 20 July 2017, with the ERG's first meeting.¹⁵ The review will be completed by the end of March 2018.

The ERG published an Issues Paper in early August to support a series of consultations/roundtable meetings across the country during August/September 2017.¹⁶ It is intended that the ERG will seek a broad range of inputs.

The terms of reference for the review to be undertaken by the ERG are as follows:¹⁷

"The Review of Australia's Space Industry Capability will build on the principles set out in the existing Australia's Satellite Utilisation Policy (2013)¹⁸ by developing a strategic framework for the Australian space sector that supports leadership, innovation, opportunity and entrepreneurship across the sector along with our broader national interests.

The Review will specifically address the following matters:

1. identifying Australia's current industry capability and areas of comparative advantage for Australia to develop,
2. technologies and practices that promote innovation in both the downstream (users of space technologies) and upstream (providers of space technologies)

15 The members of the ERG are as follows: Dr Megan Clark AC (Chair), Professor Russell Boyce, Mr Michael Davis, Dr David Williams, Dr Stuart Minchin, Professor Steven Freeland, Professor Anna Moore, Dr Jason Held and Ms Flavia Tata Nardini.

16 See Department of Industry, Innovation and Science, <https://www.industry.gov.au/industry/IndustrySectors/space/Pages/Review-of-Australian-Space-Industry-Capability.aspx>.

17 *Ibid.*

18 For an analysis of the Satellite Utilisation Policy, see Steven Freeland, 'The Final Piece of the Puzzle? The Launch of Australia's Satellite Utilisation Policy' (2013) 62:3 *German Journal of Air and Space Law / Zeitschrift für Luft- und Weltraumrecht* 429.

- elements of space activities, particularly in areas of niche capability and competitive advantage,
3. Australia's level of regional engagement and international collaboration, including identifying critical future and existing partnerships,
 4. identifying capability gaps to support the global competitiveness of Australian firms in the civil space sector,
 5. strategies to promote Australian firms engaged in the civil space sector, both domestically and internationally,
 6. risks and opportunities, including ongoing access to space data and associated infrastructure essential to our national interests,
 7. alignment with other sectors and Australian Government priorities, including Defence and cyber security, and meeting Australia's international obligations, and
 8. the most effective institutional arrangements to support the strategic direction of Australia's space industry."

2.3 Australia – Where to from Here?

The brief summary of the various initiatives instigated by the Australian Government represent, in large measure, recognition of the need to review and reform space legislative frameworks and capability strategies in light of the ever-changing space-technology paradigm. This is vital for any economy if it is to put itself in a position where it both remains competitive in a globalising technological world and also encourages and enables maximum commercial (and other) benefits to accrue from space activities and the utilisation of expertise, technology and capability. It is therefore encouraging to see the establishment of these processes and the changes and reforms that will ultimately flow from them.

3. Canada and Space

On 29 September 1962, with the launch of its first satellite, called Alouette, Canada became the third space-faring nation in the world.¹⁹ On the invitation of the American National Aeronautics and Space Administration (NASA), the satellite was designed and built by the scientists at Canada's Defense and Research Telecommunications Establishment and was launched with American Thor-Agena rocket from the Pacific Missile Range in California.²⁰ This scientific satellite, though designed to operate for one year, remained operational for ten years and 'brought Canada respect and attention from the international space community.'²¹ Consequently, Alouette provided not only technological confidence to Canadian scientists and

19 'Alouette I and II', online, CSA: www.asc-csa.gc.ca/eng/satellites/alouette.asp (date accessed: 25 August 2017).

20 *Ibid.*

21 'What was Canada's first satellite?' <http://satellites.spacesim.org/english/canadian/q4.html> (date accessed: 25 August 2017).

engineers, but also indispensable data on the ionosphere that proved useful for the design of communications satellites. This led to the design, construction and launch on 9 November 1972 of the world's first commercial geostationary satellite for communications, called Anik ('little brother' in Inuit), which was operated by the Canadian public corporation (Telesat Canada) for national telephone, data and television services.²²

Since then, Canada has significant involvement in space exploration and use,²³ which comprises niche areas like telecommunications and remote sensing that were/are considered to meet domestic needs. The third specialty in Canadian space capability is in space robotics, which emerged from the American invitation to Canada for its participation in the U.S. initiated International Space Station (ISS). These sizeable space activities for a country of about 36 million people have been pursued primarily to meet specific Canadian domestic needs, but without (a) the development of Canadian launch capability; (b) any written comprehensive and long term space policy and single overarching national legislation; and (c) any consistent allocation of significant public budget.

As an industrialized middle power, without any aspirations for global domination or significantly commanding role in international affairs, Canada has been very pragmatic in the exploration and use of space. This approach has been followed, more or less, consistently by the governments of the day, which perceived space technology as an important tool for meeting specific national economic and social needs for the well-being of all Canadians, rather than for purely global prestige and military power. These requirements stem from the very nature of Canadian geography, being the second largest land mass in the world and bordering with the most powerful nation in the South, its colonial history, nature and relatively small size of the population, constitutional and legislative system, approach to international relations essentially based on multilateralism, generally progressive industrial policy, normally liberal economic system and strong aspirations for the betterment of all Canadians from coast (Atlantic Ocean) to coast (Pacific Ocean) to coast (Arctic Ocean). These factors have invariably influenced not only the nature and extent of Canadian space activities, but also Canada's sporadic space policy and legislative initiatives²⁴ as well as its international space relations.²⁵

22 'Anik A1 satellite', online, CSA: www.asc-csa.gc.ca/eng/search/images/watch.asp?id=156 (date accessed: 25 August 2017).

23 For a list and brief descriptions of Canadian satellites as well as international satellites with Canadian participation, access to data and services, visit CSA: www.asc-csa.gc.ca/eng/satellites/everyday-lives/legend.asp (date accessed: 25 August 2017).

24 For details, see Ram S. Jakhu, 'Regulation of Space Activities in Canada' in Ram S. Jakhu (ed.), *National Regulation of Space Activities*, Springer Publishing House, the Netherlands, 2010, pp. 81-108.

3.1 The Canadian Space Economy

The Canadian space economy, though small in relative terms, makes an important contribution to the Canadian economy. The *State of the Canadian Space Sector Report 2015*, noted that ‘the space sector achieved revenues of \$ 5.3B with a workforce of nearly 10,000.’²⁶ According to a Report by Euroconsult, the Canadian space sector (a) is comprised of over 200 organizations; (b) generated \$ 750 million in taxes for three levels of governments; and (c) has an employment multiplier of 2.5 with over 24,000 full-time equivalent jobs that have grown nearly six times faster than the national job market.²⁷ As will be noted below, the significance of space activities to the Canadian industrial base and economy has widely been recognized and advocated by successive governments, review panels, independent studies and the aerospace industry.²⁸ The current Canadian government believes that ‘[s]pace is at the cutting edge of innovation’²⁹ and that scientific and technological innovations are key to job creation in and economic development of Canada. If the government implements its belief effectively, one may see space activities playing an even more important role in Canadian economy.

Canada is a middle space power in terms of the moderate extent of its space activities as well public spending. Based on the figures included in the Canadian Departmental Plans and Reports on Plans and Priorities for 2017–18 of the Canadian Space Agency, Marc Boucher states that the Government outline as ‘planned spending at \$ 432 million, a \$ 49 million increase over last year’s projection for this year. Out years see planned spending of \$ 338 for 2017-18 and \$ 330 for 2018-19 which is slightly higher than the previous Conservative government had projected. The lower out-years’ budget is also attributed to the winding down of the build phases of the RADARSAT Constellation Mission.’³⁰

25 For details, see Ram S. Jakhu, ‘Canada’s International Cooperation’ in Ciro Arévalo-Yepes and Sylvia Ospina (eds.), *Global Perspectives on Regional Cooperation in Space: Policies, Governance & Legal Tools* (IAA SG 5.11), 2016, pp. 19-39.

26 *State of the Canadian Space Sector Report 2015*, CSA, p. 3.

27 *Comprehensive Socio Economic Impact Assessment of the Canadian Space Sector, Final Report*, by Euroconsult for the Canadian Space Agency, 27 March 2015, pp. I and II.

28 For views of the Aerospace Industries Association of Canada, visit its website, AIAC: <http://aiac.ca/space/> (date accessed: 25 August 2017).

29 Hon. Navdeep Bains, Minister of Innovation, Science and Economic Development Launch of Canada’s fourth recruitment campaign for Canadian Astronauts Canadian Aviation Museum -- Ottawa -- June 17, 2016, cited in Aerospace Industries Association of Canada, *The Future of Canada’s Space Sector: An Engine of Innovation For Over Fifty Years*, September 2016.

30 Marc Boucher, ‘What You Need to Know About the Budget and Canada’s Space Program’ 22 March 2016, online at: <http://spaceref.ca/government-of-canada/what->

According to the Aerospace Industries Association of Canada, ‘Canadian government investment in space lags behind that of other OECD nations, being currently less than half the OECD average.’³¹ Though there is certainly need for increasing public funding, as has often been recommended by panel reviews and commissioned studies, it should be acknowledged that the CSA has managed very well taxpayers’ money and has achieved a lot in terms of space research and development, in initiating and operating programs like RADARSAT and Canada’s participation in several international space projects, the shining example of which is the International Space Station.

3.2 The Legislative and Policy Framework and Process for Reform – Canada

Under the Canadian constitution, *Constitution Act*, 1867,³² (as amended in 1982), Canada is a federation of ten provinces and three territories. Understandably, legislative power over outer space matters had neither been assigned to the Federal Parliament nor to any Provincial/Territorial Legislature. However, like aeronautics and telecommunications, the Federal Parliament/Government emerged to be the sole entities for adopting a space-related legislative and regulatory framework and policies, as well as for undertaking space activities in Canada.³³ There have been three phases – categories – of space related laws in Canada.

The first started when the Canadian government began exercising its power over space with the launch of Canada’s first satellite, as noted above, and by adopting the *Telesat Canada Act* and *Teleglobe Canada Act*, which created two Crown Corporations for the provision of domestic telecommunications and participation in overseas telecommunications provided by International Satellite Telecommunications of Organization (INTELSAT) respectively. Both the acts have been repealed as these entities have been privatized.³⁴ This space legislative change can be seen as the change of the ruling political scene at the federal level from the Liberal Party to the Conservative Party, which was more favorable to private business.

The second category of the Canadian space legislation is a group of existing laws and related regulations, which have been slightly amended (adapted) to

you-need-to-know-about-the-budget-and-canadas-space-program.html (date accessed 26 August 2017).

31 Aerospace Industries Association of Canada, ‘Recommendations for Growth and Innovation – Budget 2017’, online at: <https://www.ourcommons.ca/Content/Committee/421/FINA/Brief/BR8398532/br-external/Aerospace%20Industries%20Association%20of%20Canada-e.pdf> (date accessed: 25 August 2017).

32 Also known as the *British North America Act*, 1967, 30 & 31 Victoria, c. 3 (United Kingdom).

33 See, Jakhu, *supra* note 24, pp. 83-84.

34 *Telesat Canada Reorganization and Divestiture Act*, S.C. 1991, c. 52 (assented to 1991-12-17); *Teleglobe Canada Reorganization and Divestiture Act*, S.C. 1987, c. 12 (assented to 1987-04-01).

make them applicable to traditional activities, which were also to be carried out by space systems, particularly in the area of communications; e.g. *Radiocommunication Act*,³⁵ *Telecommunications Act*,³⁶ and *Broadcasting Act*.³⁷ Similarly, after making quite minor changes in the *Canadian Aeronautics Act*³⁸ and the *Canadian Aviation Regulations*,³⁹ Canada stated regulating satellite launch services. The *Export and Import Permits Act* (EIPA),⁴⁰ which is Canada's general legislation that regulates exports, imports and transfer of certain goods and technologies, covers export and import space goods technologies.

The third category of the Canadian space legislation comprises of those laws that are especially adopted to regulate specific space activities. They are: (a) the *Canadian Space Agency Act*,⁴¹ under which the Canadian Space Agency (CSA) has been established as a single governmental entity to carry out space research and development; (b) the *Civil International Space Station Agreement Implementation Act*,⁴² which was adopted in order to provide a legal basis for the exercise of Canadian criminal jurisdiction over personnel involved in the operation of the International Space Station, in which Canada has been a Partner State; and (c) the *Remote Sensing Space Systems Act*,⁴³ which governs remote sensing activities in Canada and by Canadians elsewhere.

The space policy framework of Canada has been the result of several pronouncements by governments of the day, but which have not been fully and effectively implemented. Neither did the government increase the budget of the CSA to any significant extent.

Perhaps, the most firm Canadian space policy commitment may be seen in the mandate of the Canadian Space Agency – i.e. the Agency is obliged 'to promote the peaceful use and development of space, to advance the knowledge of space through science and to ensure that space science and technology provide social and economic benefits for Canadians.'⁴⁴

The first most important study for Canadian space activities, entitled 'Upper Atmosphere and Space Programs in Canada' (the so-called Chapman Report), which was carried out in 1967, recognized the need and recommended for the Canadian satellite launch capability – i.e. 'Canada will,

35 *Radiocommunication Act*, R. S. C., 1985, c. R-2.

36 *Telecommunications Act*, S.C. 1993, c. 38 (assented to 1993-06-23).

37 *Broadcasting Act*, S.C. 1991, c. 11 (assented to 1991-02-01).

38 R.S.C., 1985, c. A-2.

39 SOR/96-433 (issued under the *Aeronautics Act*).

40 R.S.C., 1985, c. E-19. . The provisions of the Act are supplemented by *Export Permits Regulations* (SOR/97-204) and *Import Permits Regulations* (SOR/79-5).

41 S.C. 1990, c. 13 (assented to 1990-05-10).

42 S.C. 1999, c. 35 (assented to 1999-12-16).

43 S.C. 2005, c. 45 (assented to 2005-11-25).

44 Section 4, *Canadian Space Agency Act*, S.C. 1990, c. 13 (assented to 1990-05-10).

within the next decade, need to launch small scientific satellites at a rate which will justify supply from Canadian sources. Therefore we recommend: (a) the initiation of a design and cost study for a small-satellite launch vehicle and related facilities for Canadian use.⁴⁵ However, Canada made no serious attempt to develop launch capability and decided to relay on the goodwill of its friends and allies, like the U.S. Later, not to place too much reliance on the U.S., Canada decided to start space cooperation with other countries (e.g. European nations through Canadian Space Agency's cooperation with the European Space Agency) and the use of launch services provided by other countries like the Russian Federation and India.⁴⁶

The above stated Canadian space legislative framework, which has been developed and rarely reviewed/changed over a period of 50 years, seems to have worked fairly well. Therefore, the process for reform of this framework has been limited only to the *Remote Sensing Space Systems Act* (RSSSA). However, several calls and initiatives have been made to review Canada's space industry capability and related policies primarily to fully understand the role of space activities in the Canadian economy and to determine appropriate public policies.

3.2.a Review of the 2005 Remote Sensing Space Systems Act

The 2005 RSSSA was adopted essentially at the insistence of the U.S., which became concerned about its security interests since Canada's remote sensing satellite (called RADARSAT) was designed to use advanced radar sensors. On the solicitation of the U.S., Canada and the U.S. negotiated a bilateral agreement,⁴⁷ which provided the blueprint for the RSSSA. Therefore, the Act is fundamentally security oriented.

Section 45.1 of the Act requires the Minister (now of Global Affairs) to commission

“an independent review of the provisions and operation of this Act to be conducted from time to time in order to assess, in particular, its impact on technological development and on the implementation of international agreements and treaties” and to lay “before each House of Parliament within five years after the coming into force of this Act, and within every five-year period after the tabling of a report”

45 Science Secretariat, *Upper Atmosphere and Space Programs in Canada*, Special Study No 1, February 1967, p. 110.

46 See Jakhu, *supra* note 25. Also see, Ram Jakhu, ‘The case for enhanced India-Canada space cooperation’, *Space Policy* 25 (2009) 9-19.

47 See, *Agreement Between the Government of Canada and the Government of the United States of America Concerning the Operation of Commercial Remote Sensing Satellite Systems*, E103522 – CTS 2000 No. 14. Available online at: www.treaty-accord.gc.ca/print-imprimer.aspx (date accessed: 25 August 2017).

of such review. In 2012, Professor Ram Jakhu and his two colleagues at the McGill Institute of Air and Space Law (Drs, Catherine Doldirina and Yaw Nyampong), were mandated to conduct the first independent review covering the first five years of application of the Act; i.e. 2007-2012. Their Report was submitted to the Canadian Parliament and, with the permission of the Government, was published by its authors.⁴⁸ The key conclusions and recommendations of the Review were that:

- “1. The first five years of its implementation and enforcement show that although it is not perfect, [the Act] does address some important issues that need to be taken into account when conducting satellite remote sensing activities, and hence need to be reflected in a licence granted under the Act.
2. There is a lack of clarity as to whether (and to what extent) new and emerging space technologies similar to EO but different in important respects that still qualify as remote sensing (in general terms) [S-AIS] will fall to be regulated under the RSSSA. Consideration should be given to prescribing specific definitions for the different types of remote sensing data in the Regulations and/or guidelines.”

The McGill Institute of Air and Space Law was again mandated for the second independent review, which was conducted in February 2017 by Professor Ram Jakhu and his graduate student, Mr. Aram Kerkonian. The Report of the review was presented to the Canadian Parliament on 5 April 2017 and its text has been published by the Department of Global Affairs.⁴⁹ Some of the key recommendations regarding the updating of the RSSSA are:

- “1. Make the language of the Act more clear in regards to remote sensing, Earth observation and whether the latter falls within its purview.
2. Monitor remote sensing security strategy to ensure Canada’s security interests are maintained despite changing international players and evolving and divergent interests.
3. Embed within the Act different ways of stimulating commercial interest so that the balance between security and technological development is regained.
4. Establish an independent regulatory body that is tasked with overseeing the RSSSA from the perspective of reviewing applications, granting licences, conducting inspections, monitoring compliance, etc.
5. Engage foreign allies in high- and low-level discussions in an attempt to harmonize the various rules, procedures, standards, methods and strategies by which remote sensing operations are regulated.

48 See, Ram S. Jakhu, Catherine Doldirina and Yaw Otu Mankata Nyampong, ‘Review Of Canada’s Remote Sensing Space Systems Act Of 2005’, XXXVII, *Annals Of Air And Space Law*, 2013, pp. 399-424.

49 Global Affairs Canada, *Independent Review of the Remote Sensing Space Systems Act*, online at: http://international.gc.ca/arms-armes/assets/pdfs/2017_review_of_remote_sensing_space_systems_act.pdf (date accessed: 25 August 2017).

6. Enact a general Outer Space Act that would apply to new and emerging space activities as they become a reality.”

Besides the RSSSA, no other Canadian space law is being reviewed. There are some ideas being floated around about the adoption of a comprehensive national space law (Outer Space Act), regarding which the 2017 Independent Review also made a recommendation.

3.2.b Review of Canada’ Space Industry Capability and Policy

Since the first two important studies in 1967 about Canada’s space industrial capability and policy⁵⁰ by the Science Secretariat (Chapman Report) and about the Canadian space program by the Science Council of Canada,⁵¹ there have been several studies and reviews by the government of Canada, research institutions and the aerospace industry. During the last five years, five studies and reviews have been carried. They all invariably stress the importance of increased investment in a space program for Canada mainly for industrial, economic, security and social purposes.⁵² Among them the most recent one is the Report of the Space Advisory Board (SAB).

On 18 April 2017, the Minister of Innovation, Science and Economic Development (ISED) created the Space Advisory Board⁵³ and mandated it to:

“conduct outreach and consultations with stakeholders on a vision that:

- Encourages a growing and sustainable space sector in the long term;
- Inspires Canadians and attracts talent;
- Contributes to scientific advancement and the development of emerging technologies; and
- Supports companies to scale-up as well as clean growth.”

50 Science Secretariat, *Upper Atmosphere and Space Programs in Canada*, Special Study No 1, February 1967. (Chapman Report).

51 Science Council of Canada, *A Space Program For Canada*, Report No. 1, July 1967.

52 They are: (1) Aerospace Review mandated by the Government of Canada, *Reaching Higher: Canada’s Interests and Future in Space*, Volume 2, November 2012 (Emerson Report); (2) The Honourable James Moore, Minister of Industry, responsible for the Canadian Space Agency, *Canada’s Space Policy Framework: Launching the next generation*, 2014-02-07; (3) EUROCONSULT, *Comprehensive Socio-Economic Impact Assessment of the Canadian Space Sector*, for the Canadian Space Agency, FINAL REPORT, 27th March 2015; (4) Aerospace Industries Association of Canada, *The Future of Canada’s Space Sector: An Engine of Innovation For Over Fifty Years*, September 2016; and (5) Space Advisory Board, *Consultations On Canada’s Future In Space: What We Heard*, August 2017 (SAB Report).

53 Government of Canada, *Space Advisory Board*, online at: https://www.ic.gc.ca/eic/site/ad-ad.nsf/eng/h_ad03983.html (date accessed 30 August 2017).

After consultation on a new space strategy with numerous stakeholders in various parts of Canada, the SAB submitted on 18 August 2017 its report comprising findings and recommendations.⁵⁴ One of the findings is:

“Participants noted that in the past Canada has had a very successful space program that met national needs and created an internationally competitive space industry and science capability. However, almost all stressed that Canada has lost ground in a world environment driven by rapidly changing technology and substantial increases in space investments by other nations. Participants supported the need for a space strategy, but stressed the urgent need for a reinvigorated and fully funded set of space activities and supporting policies to successfully implement the space strategy. Many felt that action is needed now before too much capacity is lost.”

The SAB made six critical recommendations for consideration by the Minister.⁵⁵ They are:

1. Designate Space as a National Strategic Asset: Recognize space as a strategic sector essential for our sovereignty, security, and economic growth that is worth sustaining and growing.
2. Strengthen World-Class Canadian Capabilities: Adopt policies, use procurement and seek international cooperation to support the growth of an internationally competitive space industry and scientific capacity.
3. Adopt New Policies and Regulations to Capitalize on Technological Advancements: Adopt policies, and review existing regulations to make them responsive to the realities of the New Space environment.
4. Continuity of Policies and Sustainable Funding: Pursue a balanced space program in program sizes, phasing and category.
5. Outreach and Education Programs to Inspire and Prepare Canadians: Undertake extensive outreach and public education to engage Canadians of all ages in the space program.
6. An Urgent Call to Action: Reverse the decline in Canada’s space capability before it’s too late.”

The SAB also recommended that the Minister should ask the Space Advisory Board to:

- engage stakeholders on plans for implementing the Space Strategy;
- provide independent advice on the implementation of the Space Strategy; and
- develop metrics for evaluation of the implementation of the Space Strategy.

54 *Government of Canada welcomes new Report on the country’s space sector*, online at: https://www.canada.ca/en/innovation-science-economic-development/news/2017/08/government_of_canadawelcomesnewreportonthecountryspacesector.html

55 SAB Report, *supra* note 52, p. 1.

Among the key proposals, the SAB recognized “the New Space environment as critical to future growth and adopt policies (regulatory, procurement, legal, financial) that support and encourage New Space entrepreneurship.’ In this context, it noted some specifically recommended suggestions,⁵⁶ including:

- “1. Adopt the key recommendations of the 2017 report by McGill University’s Institute of Air and Space Law regarding the Remote Sensing Space Systems Act to make it more responsive to global realities affecting the development and exploitation of space technology both in space and terrestrially.
2. Update the regulatory regime for space activities to make it more “user friendly”, more responsive to emerging technologies and the needs of New Space, more transparent, more flexible, speedier and more aligned with Canada’s strategic interests.”

The Aerospace Industries Association of Canada applauded SAB’s call for urgent action by the government and expressed its support for the Board’s recommendations.⁵⁷

3.3 Canada – Where to from Here?

It is difficult to predict where Canada will go from here with respect to its space program, space policy and space legislation. However, if the current government exercises its political will and if the SAB is retained to continuously provide independent advice on the implementation of the Space Strategy, there is a possibility that Canada may see some concrete actions with respect to the implementation of the recommendations by the SAB and the 2017 Independent Review of the RSSSA.

4. Conclusion and Final Remarks

Even though Australia and Canada have similar colonial history, membership in the British Commonwealth, extensive large sizes of their territories sounded by oceans, nature and relatively small size of their population, and constitutional and legislative systems, yet this brief discussion of the space regulatory regimes and policy frameworks in these two countries shows that each of them pursues its own space strategy and adopts its space laws and policies to suit its respective needs and reflects their unique priorities. It also indicates that space laws and policies are considered to be important tools for the development of their space programs, which are being increasingly recognized as almost indispensable for their overall industrial and economic advancement, national security and social well-being of their citizens.

⁵⁶ *Ibid.*, p. 7.

⁵⁷ AIAC response to the release of the Space Advisory Board Report, August 18, 2017, online at: <http://aiac.ca/aiac-response-release-space-advisory-board-report/> (date accessed: 30 August 2017).

