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**SENATE STANDING COMMITTEE ON
ECONOMICS**

Tuesday, 22 July 2008

Members: Senator Hurley (*Chair*), Senator Eggleston (*Deputy Chair*), Senators Bushby, Cameron, Furner, Joyce and Pratt

Participating members: Senators Abetz, Adams, Arbib, Barnett, Bernardi, Bilyk, Birmingham, Mark Bishop, Boswell, Boyce, Brandis, Bob Brown, Carol Brown, Cash, Colbeck, Jacinta Collins, Coonan, Cormann, Crossin, Ellison, Farrell, Feeney, Fielding, Fierravanti-Wells, Fifield, Fisher, Forshaw, Hanson-Young, Heffernan, Hogg, Humphries, Hutchins, Johnston, Kroger, Ludlam, Lundy, Ian Macdonald, Marshall, Mason, McEwen, McGauran, McLucas, Milne, Minchin, Moore, Nash, O'Brien, Parry, Payne, Polley, Ronaldson, Ryan, Scullion, Siewert, Stephens, Sterle, Troeth, Trood, Williams, Wortley and Xenophon

Senators in attendance: Senators Abetz, Bushby and Hurley

Terms of reference for the inquiry:

To inquire into and report on:

The current state of Australia's space science and industry sector, examining options to strengthen and expand Australia's position in fields that strongly align with space science and industry, giving consideration to any national strategic coordination requirements and taking into account findings and policy options of the National Innovation System Review, with particular reference to:

- a. Australia's capabilities in space science, industry and education, including:
 - i. existing Australian activity of world-class standard, and
 - ii. areas in which there is currently little or no activity but that are within the technical and intellectual capacity of the country;
- b. arguments for and against expanded Australian activity in space science and industry, including:
 - i. an assessment of the risks to Australia's national interest of Australia's dependence on foreign-owned and operated satellites,
 - ii. the potential benefits that could accrue to Australia through further development of our space capability,
 - iii. economic, social, environmental, national security and other needs that are not being met or are in danger of not being met by Australia's existing space resources or access to foreign resources,
 - iv. impediments to strengthening and expanding space science and industry in Australia, including limiting factors relating to spatial information and global positioning systems, including but not limited to ground infrastructures, intergovernmental arrangements, legislative arrangements and government/industry coordination, and
 - v. the goals of any strengthening and expansion of Australia's space capability both in the private sector and across government; and
- c. realistic policy options that facilitate effective solutions to cross-sector technological and organisational challenges, opportunity capture and development imperatives that align with national need and in consideration of existing world-class capability.

WITNESSES

DORE, Mr Jocelyn (Josh) Joseph, Technology Development Officer, Canadian Space Agency 2

KOLACZ, Mr Richard, Director of Mission Development, COM DEV International 2

**STAJCER, Mr Tony, Vice President, Corporate Research and Development, COM DEV
International 2**

Committee met at 12.01 pm

CHAIR (Senator Hurley)—I declare open this meeting of the Senate Standing Committee on Economics. This hearing has been convened to receive evidence in relation to the committee's inquiry into the current state of Australia's space science and industry sector. It is the third public hearing of the inquiry.

The Senate referred this inquiry to the committee on 19 March 2008 and an interim report was released on 23 June 2008. The inquiry's terms of reference require the committee to examine options to strengthen and expand Australia's positions in fields that strongly align with space science and industry, giving consideration to any national or strategic coordination requirements and taking into account findings and policy options of the national innovation system review. The committee is to pay particular reference to Australia's capabilities in space science industry and education, arguments for and against expanded Australian activity in space science and industry, and realistic policy options that facilitate effective solutions to cross-sector technological and organisational challenges, opportunity capture and development imperatives that align with national need and in consideration of existing world-class capability.

These are public proceedings, although the committee may agree to a request to have evidence heard in camera or may determine that certain evidence should be heard in camera. I remind all witnesses that in giving evidence to the committee they are protected by parliamentary privilege. It is unlawful for anyone to threaten or disadvantage a witness on account of evidence given to a committee and such action may be treated by the Senate as a contempt. It is also a contempt to give false or misleading evidence to a committee. If a witness objects to answering a question, the witness should state the ground upon which the objection is taken and the committee will determine whether it will insist on an answer, having regard to the ground which is claimed. If the committee determines to insist on an answer, a witness may request that the answer be given in camera. Such a request may of course also be made at any other time.

[12.03 pm]

DORE, Mr Jocelyn (Josh) Joseph, Technology Development Officer, Canadian Space Agency

KOLACZ, Mr Richard, Director of Mission Development, COM DEV International

STAJCER, Mr Tony, Vice President, Corporate Research and Development, COM DEV International

CHAIR—Welcome. Thank you for taking time out from the Australian Space Development Conference to be with us today. In many ways, Canada is a country most like Australia, and it is very interesting to be able to hear what is happening over there. Would you like to make an opening statement?

Mr Kolacz—Yes. First of all, it is my pleasure to be here today. COM DEV International is Canada's largest manufacturer of space technology. I would like to thank you for the opportunity to address this hearing. Since 2006, I have been investigating countries and industries which could support our spacecraft development program. I have been involved in interactions with industry, universities, research facilities and civil and defence organisations in Australia.

My initial interest was focused on two specific areas: firstly, identifying technical and research capabilities which could support the spacecraft and mission development activities that I have been pursuing on a global scale; secondly, identifying civil, security and commercial requirements that exist within Australia and which could be satisfied cost-effectively through the use of low-cost base assets. My interest in this area was driven by the similarities, as you have discussed, between Australia and Canada—countries which both have a large landmass and relatively small populations and also similar requirements and views relating to maritime security, safety, surveillance, environmental monitoring and resource management.

On the first point, I have found a range of very good capabilities and technologies associated with the space, ground and data-processing segments. However, in my opinion, what was lacking was an ability to bring these elements together. On the requirement side, I have found that many similar requirements exist between Australia and Canada, particularly in the areas of maritime surveillance, environmental monitoring and resource management.

My activities over the years have revealed that Australia has a number of requirements that are very similar to Canada's and that we could, in fact, provide solutions to satisfy these requirements. I am happy to say that I have had the opportunity to submit a white paper which discusses means by which we could make use of the capabilities that exist in Australia and Canada to satisfy the national requirements of both countries, using our capabilities so that the funding is invested back into the industry, and then in turn allowing us to commercialise the technology that we have developed to satisfy those same requirements on a global scale. Thank you.

CHAIR—As you say, Australia and Canada have a number of interests in common and we could work together more closely. Our inquiry will be looking at whether the government should commit more resources or redirect resources into the space science and industry sector. What kinds of benefits have you found from your investment in that sector?

Mr Kolacz—I will provide my comments, and then my colleague from the Canadian Space Agency will comment as well. We have found that, in the initial stages, it is very important to have support from the government, not in providing support to the industry but in helping us demonstrate that we can solve a problem. I will talk about a real world example underway at the moment. Canada, like Australia, has a requirement to achieve maritime surveillance, to understand what vessels are approaching our coasts out to a range of 1,000 nautical miles. So there is a requirement; there is a budget. We presented a solution to the government of Canada by which we could satisfy this with a small spacecraft platform.

The way that I see it is that we are not looking to provide a space mission; we are looking to provide a solution to their problem but it just so happens that it involves the use of a space asset. The government of Canada has funded a mission to allow us to go forward and to demonstrate the capability that we can achieve in space. It is funding a single spacecraft mission to the value of \$10 million in this case. That has allowed us to demonstrate to all the maritime countries around the world that we can provide a maritime picture out to 1,000 nautical miles. That has in fact enabled us to look at putting up a constellation of six spacecraft and to start up a brand-new business based on demonstrating that capability in Canada. In fact, we are briefing Border Protection Command of the same capability. It is the ability to demonstrate that we can meet a national requirement with the funds that are available and then take that and commercialise it.

I believe that we have invested roughly \$10 million in R&D in our own company, but we will leverage through that the opportunity of \$180 million in sales. We have noticed that a small amount of money and an opportunity to demonstrate a capability provide at least a tenfold increase in exports around the world, in addition to satisfying our national requirements.

CHAIR—Mr Dore, do you wish to add to that and on the capacity in which you appear?

Mr Dore—Yes, if I may. I report to the director general, Gilles Leclerc, who is the space technology development director. I will focus my comments on heritage and partnership. Canada has enjoyed great success in the space domain, largely due to our international cooperation and participation programs. The Canadarm, the Canadarm 2, the Phoenix mission, Dextre and the astronaut program are all benefits that have come about from our participation in the NASA and ESA programs. Without that, our space program would not have the worldwide reputation that it has, and our industry would not be as successful as it is. Our contribution to ESA alone has resulted in over \$420 million in contracts. That is not small change.

Participation in ISS has given us the opportunity to have a national astronaut program, which is very successful. Nine astronauts have participated in 13 missions so far. In 2009 we will have the first Canadian going onto the ISS for an extended length of time. Space by its nature is an international asset and domain, and no country can afford to go into it alone, especially for space science and exploration. It has been very good to us. We hope that we are going to continue participating with other nations, such as maybe Australia and other like-minded countries, on issues and concerns that are similar in nature.

CHAIR—Thank you. I would like to welcome one of the original sponsors of this inquiry, former Senator Grant Chapman.

Senator BUSHBY—Thank you for coming here today and for your comments. They are much appreciated. I am particularly interested in what Mr Dore has just commented on in terms of the ESA and NASA. Would you be able to explain in a little more detail what relationships you have with those two agencies and how they work in practice?

Mr Dore—Basically, with ESA, we contribute to R&D and mission development. Essentially, what we do is that we give money to ESA. That money is returned to the Canadian industry to develop technology or payloads on ESA missions.

Senator BUSHBY—So you have an agreement with ESA that you have entered into.

Mr Dore—Correct.

Senator BUSHBY—Are you a member of ESA or an associate member?

Mr Dore—We are not a member. We are an associate; a partner. For example, we were the first non-European country to join the Galileo program. As a result of that we have several companies in the GNSS domain who have secured contracts. Since Galileo will be here for many years to come, that spells out great opportunities for Canadian industry. That is just one small niche.

Senator BUSHBY—And the ESA was very keen to embrace Canada's involvement in what they are doing?

Mr Dore—Very much so.

CHAIR—Is there any cost to Canada associated with that?

Senator BUSHBY—They give them money, but they get it back.

Mr Dore—We pay to play, basically. The money that we invest is returned directly to our industry. It gives us access to the European market. It showcases our capabilities; it increases a niche market and so on.

Senator BUSHBY—I am just trying to get straight in my head the benefits for both parties involved in that relationship. I will move onto NASA in a moment. You are saying that you give them \$10 million or thereabouts as your contribution to the program, but you get \$420 million worth of contracts back. How do the European member nations of ESA feel about that? Are you doing things that they could not have done? Are you taking things away from them?

Mr Dore—In many cases, that is the case. We have unique niche markets. We have separated ourselves to be world leaders in many areas. We have come to that point because we have funded other technology development on other missions and under other initiatives. Through that long-term involvement, the industry is now in a position to compete with and complement other activities offshore.

Senator BUSHBY—So in summary then you are saying that Canada and its industries can offer unique things that add to the ESA, and that is part of the reason why you have that partnership and why they are embracing Canada.

Mr Dore—Correct.

Senator BUSHBY—So if Australia were going to do something similar with the ESA, we would need to demonstrate that we can bring things to the table other than a wad a money.

Mr Dore—For me, it is worth mentioning that about 50 per cent of the \$2.5 billion in revenues that space activities bring to Canada is due to export. Canada is probably the world leader in that department. Our satcom industry, for example, brings in 75 per cent of all space related revenues. We are a world leader in satellite communications. We have had many firsts since the first launch in 1962 of the Alouette 1. Ever since then, we have broken barriers in being the first to provide Ku band, the first to provide the Triband satellite, the first to have a domestic satellite in geosynchronous orbit and the first to collocate two satellites in a geosynchronous orbit. These are all Canadian firsts. We try to embrace this and have our industry go offshore and provide consultancy services, assistance with designs and even parts. COM DEV is one of those successful companies that has participated in many international projects, including Iridium. They would be more qualified to answer about those. All of that would not have been possible without firstly having a long-term space program and secondly having a well-understood funding envelope which can be sustained and used to encourage industry to identify niche markets, gain the knowledge and expertise and then hopefully commercialise what they are good at.

Senator BUSHBY—I hear everything you say there. You are from the Canadian Space Agency. How important is having a Canadian Space Agency to coordinate and oversee and develop the long-term space program? How important is having a dedicated body that is responsible for that and that is funded to do that?

Mr Dore—I would say that it is crucial. I do not think that it could be done without it. One of the things that is very important and that would be missed through not having a space agency is that the industry cannot compete successfully on their own. But there are also advantages in having a space agency that helps with the funding and helps with the R&D costs, which are quite extensive. It also ensures that the government users and the public good are looked after. The industry may not have those as their first and foremost interests. They are more or less there to make money.

To give you an example, we have a very successful satellite operator by the name of Telesat in Canada. The latest satellite, which was the ANIK F2, was a commercial satellite. The Canadian Space Agency paid \$80 million to have a demonstration payload on that commercial satellite. What that did was push the technology forward. It has allowed Telesat and hence Canada to be the first to provide Ku band services. In return, it has provided Canadians in northern communities with bandwidth and given them for the first time the chance to be connected. You have to keep in mind that in the northern communities there is no high-speed internet. Most people only have satellite connections. This has worked for the public good. It is opening doors for telehealth, telemedicine, tele-education and telecommerce—all new opportunities for small

and medium enterprises which were not possible prior to this investment by the CSA. This is an investment that Telesat might not have made on their own.

Senator BUSHBY—What budget does the CSA have? Is that something that you disclose?

Mr Dore—We have a \$300 million budget, which is modest. To be frank, it has been pretty much on a flat line for the last five or six years.

Senator BUSHBY—Is that fully funded by the Canadian government or is there business assistance?

Mr Dore—It is all federally funded.

CHAIR—You were talking about satellites. There is a suggestion in your submission that Australia might engage with Canada on microspace and developing a satellite system that would cross across both countries.

Mr Dore—Correct. One of the recent concerns in Canada is the emphasis on northern sovereignty. Even though Canada is a world leader in satellites, all of our satellites are at GEO. Basically, GEO has a limit as to how far north you can look. Typically, it is 70 to 80 degrees. The sovereignty debate is about areas above the 80 degree latitude, so we need a solution that is a non-GEO solution. There are several options. Two of them are being studied. One that is very interesting is the one proposed by COM DEV whereby we would have an inclined LEO constellation of 10 to 15 satellites which would provide continuous coverage of both poles, north and south. To us, northern coverage is certainly important. But there may be some benefits for a country like yours which has an interest in the Antarctic.

CHAIR—We have heard evidence previously that a lot of satellites cover Australia and its regions because of the nature of our geography. We have wide access to that satellite information from other countries' satellites. Is there a particular benefit that you would see in us joining with Canada and owning that satellite system?

Mr Dore—The answer is in the phrasing. You would own something. In Canada we do not own military satcom satellites. All our satellites are domestic. We turn south of the border, to the US, for any military capabilities. It is not cheap. The problem with that is that you buy bandwidth at a price and sometimes it is bandwidth that is only available in peacetime. At crucial times, the bandwidth is no longer available because the US military needs it. By not owning a satellite, you are along for the ride and you get what is available. To give you an example: one military satellite that is of most interest to Canada is the Advanced EHF, which is the follow-on to the Milstar. The Milstar is an all-singing, all-dancing satellite which has tonnes of capabilities, including antijamming protection and so on, and a very expensive payload. We are contributing, I believe, \$250 million to \$400 million to get four per cent of the capacity on this constellation. When the MOU was signed between us and the US, it called for a minimum of four satellites in the constellation, because four satellites give worldwide coverage. That constellation since has fluctuated to as low as two satellites. Now it is back to three satellites. This is for funding reasons. Every year they have to go to congress and get the budget approved. When you have two satellites, you no longer have what you signed up for. You do not have worldwide coverage.

CHAIR—So your contribution remains the same but the service is less.

Mr Dore—Correct. When you piggyback on somebody else's constellation, you are at the mercy of that program. I have always said that we have all the technology in Canada to build a satellite and to operate it—all we have to do is get somebody else to launch it—so why not have a satellite constellation, a multinational constellation with non-US participation, whereby participating countries with common interests could own their own constellation. It is not a far-fetched dream, as far as I can see. We all have the same problem. Satellites are expensive, but there are always ways to share costs and risk and get mutual benefits.

Senator BUSHBY—I was just going to change tack slightly and ask: do you have any educational centres of excellence for space science in Canada? Do you focus on any particular universities or is it a laissez-faire sort of situation, where some universities choose to run courses that are relevant to space science? Is there any structure to it? How does that work in Canada?

Mr Dore—We have a number of universities with space interests. I could name 10 or 12. Their interests range from rocket sciences to GNSS applications to software development to orbital—you name it. This is good when we come back to the question: why have a space agency? A lot of our programs or missions have involved universities. The universities have developed, for example, the MOST, which is the world's smallest space telescope. One university built the bus; another university built the telescope. So it was a full Canadian solution, partly funded by the CSA—very successful.

This type of activity motivates the youth to want to go into a space related field, because there is hope, aspiration and an industry ready to employ you to work on exciting programs that are national and international. Those are all things that are important to sustain the knowledge, to keep the workforce at home. You need a program that is well funded, well understood, with a good vision. And once the machine is built you have to oil it so that it keeps running. I was talking yesterday to some of your university students, many of whom have expressed strong interest in coming to Canada. They were asking us, 'Would you be willing for us to either work at a company or come and work at the CSA?' At the CSA every year, we have between 50 and 60 students coming through our doors for a period of three months just to work alongside our engineers and scientists to learn what we are all about, to get excited about what they are studying in school.

Senator BUSHBY—Many of the submissions made to us by academics and others in Australia suggest that we have a lot of expertise in various educational institutions but there is really nowhere for them to go on to, like the CSA; we do not have an Australian equivalent.

Mr Dore—Perhaps I may add something. In my former life, before I came to the CSA, I was in uniform and I had the opportunity to teach at the Canadian Forces School of Aerospace Studies. One of our courses was the aerospace systems course. That was a year-long international course at a post-grad level. We often had, I think, a span of 12 to 13 officers from the Royal Australian Air Force coming to our school. This course was to make them smart buyers in terms of technology, from understanding the requirements all the way to equipment acquisition, limitation testing and so forth. I must admit—and the record can show—that every year the Australians that came through our doors ended up consistently, 95 per cent of the time,

winning all the awards for the top students, the best papers and the best presentations. So you have smart folks and I assume that is a good reflection of your population.

CHAIR—Of course!

Senator BUSHBY—We keep the smart ones at home.

Mr Dore—There is something good with your education system. You have very sharp people who are willing to learn and are excited about what they do. The logical step is to go to space. The sky is the limit, but space is infinite.

Mr Stajcer—I would like to add a comment, if I may. I have been working with CSA for many years. Just to add to what is being said, one of the key things is that we see two similar countries that have similar populations. We also see that the economic positions are similar. There are vast areas that we need to reach in remote locations, for example, in order to provide them with a broadband facility. Such situations are the same in both countries.

Also, educating people and getting them into space is very important when it comes to economic drivers in terms of jobs. We at COM DEV in Cambridge have almost 1,000 positions all working on space technology, and those positions cannot be exported out to China or Taiwan. We are working with the Ontario government. They are worried because, in the automotive industry, the plants are being shut down. Southern Ontario has been a mecca of auto parts, and plants are closing and jobs are being lost. They are turning to aerospace and space, as they see this as an area where the manufacturing jobs will stay. The high-end engineering and scientific people, who are highly skilled, will stay in aerospace manufacturing in the country, and those jobs are not exported easily. Space is unique and it requires custom built applications, which creates a highly skilled workforce that remains in country. We see that as a great economic benefit.

We talk about contributions coming back from ESA, for example. From CSA making a contribution of €500,000, we may get a resulting contract worth €20 million to supply a larger part. With that small investment, we become the leaders in that area because companies, such as Astrium, EADS and Thales, will come to us for that equipment on a worldwide scale. Eighty per cent of our company's business is in exports, so that speaks to the wealth created within the country and the export sales that are generated. At one time we were also involved in wireless due to tough global competition. As you are probably aware, Nortel was one of the biggest companies out there worldwide. When we exited our wireless endeavours, we went back to space because that is where the sustaining economic conditions could prevail. We could right our company and get back on track, and we have done that over the last six years.

Space has provided us with our jobs and our security going forward. We think that as a country in partnership with other countries we can create great things. We can monitor the environment, we can create economic conditions to sustain our highly skilled people in our education system and we can cooperate with other countries. Really, no country in space can go it alone. Even with the great NASA, we are supplying the pointing system for its James Webb Space Telescope; basically, that will become the eyes of the telescope. We are experts in optics and are providing that subsystem to NASA. So they are dependent on the Canadians to do that.

I think even in that sense we have an international reputation, we retain the skills and the manufacturing at home and that provides a great economic condition for us in Canada. That is all with early participation with CSA, with the space agency, helping us to network and helping us to get out to other countries. So it is very important to have that partnership between industry and CSA.

Senator BUSHBY—That is all very interesting. The paper that COM DEV has put out here is a framework for collaborative space activity Australia-Canada. Quite clearly Canada has taken a proactive approach to partnering with a number of nations and ESA and also NASA as we have mentioned. I guess your advice to us looking forward would be that we should be looking at partnering with a range of nations, and Canada—a lot of equivalent challenges that we face and it would be a good place to start, but also ESA, NASA as appropriate to what the technologies and the directions that we actually head in. You are nodding?

Mr Stajcer—Yes, I agree with that. I definitely agree with that. I think Canada, because of economics, we are a similar country, similar populations. We have 30 million or around 30 million people; you are around 20, I am guessing.

Senator BUSHBY—Twenty-three I think—not quite, 22.

Mr Kolacz—I would also stress that, within the concept that we present, it talks about the use of microspace, which is really missions in the range of \$10 million to \$20 million. They can satisfy national requirements. So, if we do a fifty-fifty mission, for example, 50 per cent of the funding is provided by Canada and 50 per cent by Australia. One hundred per cent of it is reinvested back into your industry and you own 100 per cent capability because, when the satellite is flying over Canada looking for forest fires, we are using it and operating it. When it is flying over Australia, for example, looking for fires, you have 100 per cent control and operation. So for a very modest investment you can develop a capability that satisfies your national requirement and then NASA with the Australian partner who has developed the instrument—we will go and market that around the world to every other country that is concerned about forest fires. So that \$7 million investment will enable us to build another five, six, seven, 10 satellites and sell it.

That is the model that we use and that is why I am saying that again what we were recommending in the white paper that I submitted was a modest approach looking at one of these missions that are really not that expensive. I am suggesting when I spoke to Australian industry: do not talk about a space mission, saying, ‘We’re solving a problem that the government has identified that said they need to do.’ They are going to spend money for somebody to monitor water. Why doesn’t it go to an Australian company? Canada has the same requirements, so again we can satisfy a Canadian requirement and an Australian requirement at half the cost. Once we have developed that capability, we will take it to Malaysia, to Africa and South America. We are talking to those people already and we are going to go away and do this regardless. We have already done this on maritime surveillance. We came here to try to work with Australia, but our train had already left the station. But we see additional opportunities and every time I come back here it is such a good fit in terms of the similarities and the requirements that it makes sense and that is why we continue to come back.

Senator BUSHBY—Do you find it frustrating that we do not have a central space agency that you can come and talk to that can help coordinate it?

Mr Kolacz—It has been difficult. When I came here first of all, I said, ‘So who do I talk to that is coordinating your requirements and the industry?’ and there was no-one.

Senator BUSHBY—There is somebody in one of the departments, but—

Senator ABETZ—Didn’t they name Senator Chapman?

Mr Kolacz—His name did come up, yes.

Mr Stajcer—I would like to add to Richard’s comments, we have so much capability now in microsats, the industry is so developed that now it really is a business solution. It is not exploration anymore. We are trying to solve problems with business solutions so it is more of an investment that you will get back. It is not any more—okay, the government is taking all the risk and putting money in. This solution—we are looking to generate a commercial business and a viability that is going to be sustainable going into the future. We are talking about having microsat space where we can do a lot of things that 10 years ago we were not able to do, but new advances in software and processors and so on empower these systems. We are now able to do a microsat for \$10 million. Today we can do a lot with that, and it makes economic sense as opposed to investing \$200 million or \$300 million doing something terrestrial. We compete against that. We provide an economic solution to a problem.

Mr Kolacz—I guess a good analogy was when we had someone discussed in the early days—you had IBM with the super computers and then along came the microprocessor and home PCs, and now what can you do with those? An incredible amount, and that is what we are discovering as well. That is why in fact part of the reason we came to Australia was to look for like mid-sized countries that had similar requirements and strong technical capabilities and we are focusing on again not asking for a handout; we are saying, ‘Do you have a problem here? Do you want to do maritime surveillance? You can fly 10 maritime patrol aircraft that can see this much, and it is going to cost this much to operate over a year or we can put one satellite up there without all of the people that are required that is going to see this much and it is going to cost a fraction of the cost.’ So we are really looking to solve problems in the most cost-effective manner. Where it does not make sense to do so using microspace, we do not go there.

Senator BUSHBY—You mentioned you have been a here a couple of times now—is that right?

Mr Kolacz—Correct.

Senator BUSHBY—And there was some frustration in terms of: where do you go? Are you finding the right direction? Are you able to talk to the people you need to now? Is there any assistance that the government needs to give to help move things along at this point in the absence of a dedicated space agency?

Mr Kolacz—I am sure there could be. We have very good contacts. We have talked to a number of people. What we strive to do is to work with Australian industry and to say to them:

‘Go and find where there is a requirement. What is the need that your government has and the funding that they have associated with it? We will work with you to provide a solution.’ I think one of the challenges maybe is, when we put a white paper together—let us say for water monitoring requirements—who do we send that to? Which department is responsible for it? How does it work? We are continuing to learn about that but, clearly, if there were support from the government in telling us how to move this mechanism forward to satisfy the existing requirements that you have, that would be beneficial.

Mr Dore—I have a brief comment on the issue of having or not having a space agency. Having an agency gives you a centralised, unified voice that can look after the governance and provide leadership, vision and so on and so forth. Our space agency reports directly to our minister of industry, so our president is the same level as an ADM, associate deputy minister. That is pretty high on the federal ladder, so what our administrator says is heard in parliament. So we have very close ties; we are very close to the front door.

CHAIR—On that subject, in your presentation you mentioned that the CSA provides R&D funding to Canadian companies to support planned missions. We heard evidence that space related sciences here sometimes have trouble getting R&D funding because of the slightly different nature of their research, either long term or collaborative or whatever. So your agency steps in at that stage to provide R&D.

Mr Dore—Yes. We have a program called the STDP, Space Technology Development Program, which is an R&D mechanism. There are three elements—this will change next year—putting R&D money into innovation for pure out-of-the-box thinking; R&D for sustained, planned missions that are sponsored and led by the CSA; and also money to enhance industrial capabilities. The mechanism for this is we request proposals on priority technologies, and we get bids from the companies. Whoever wins, gets some money. That is one mechanism. We also accept unsolicited proposals. If they have a good idea, they can come to us and submit it for the LEO constellation for northern sovereignty. We accept that too and we have a pocket of money strictly for R&D.

Senator BUSHBY—It was mentioned earlier—I am not sure by who—that you can develop a satellite; you just need somebody else to launch them. We have had launch facilities in Australia in the past at Woomera—I do not think there has been too much launched there in recent years. Has Australia as a country where you could launch satellites been something that you have considered or looked into or talked to people about?

Mr Dore—That would be very interesting. In Canada, we consider ourselves a first-tier spacefaring nation. But, having said that, we do not have a launching capability, so that is one of the things we are studying now. In Canada, we are not a big satellite integrator. Sure, we have done radar satellites but we do not do geosatellites. We turn to the US for US buses. But we could have a very strong market in microsats, nanosats—all those small satellites—and we are currently looking actively into developing a launching capability for those satellites.

Senator BUSHBY—In Canada.

Mr Dore—In Canada. Having said that, nothing stops us from having it on Australian soil.

Senator BUSHBY—If a suitable agreement could be reached, yes.

Mr Dore—Yes, a working partnership.

Mr Stajcer—There are probably advantages for certain orbits. You are closer to the equator if you launch from here. But it also depends on the orbital dynamics. There is a possibility that it would be most economical in some cases to launch from Australia. So I think there would be natural cooperation, especially if you are now looking into launch capability. There could be something that could be developed together and offered commercially. We asked a question about this today at the conference. They believe that in the future there will be many microsats going up—although they have developed big launch capabilities for large satellites, it is believed that there is room for smaller launch capabilities. They believe there will potentially be many tens and hundreds of microsats in the future. So there are possibilities there.

Senator BUSHBY—Opportunities, yes.

Mr Stajcer—Opportunities exist.

Senator ABETZ—In a former life I was the Minister for Fisheries, Forestry and Conservation. The submission has excited my interest inasmuch as the potential for undertaking surveillance of our quite extensive exclusive economic zone. With what regularity would the satellite be passing over Australia as we are shown on page 5 of the submission?

Mr Kolacz—This is the one area in which we have in fact generated a mission that the CSA is sponsoring. As a result of the market information we have received we are now proceeding with building up our own constellation. We are designing a constellation including satellites and ground stations that will have a maximum revisit time at the worst location at the equator of approximately 90 minutes. In all other regions, when we are talking about Canada, it is basically every 10 to 15 minutes. We could do the analysis, and this is what Border Protection Command will be asking, but you will see out to 1,000 nautical miles over Australia every 20 to 30 minutes.

Senator ABETZ—To what sort of accuracy? Let me get to the point: would we be able to pick up the wooden junks that come over from Indonesia?

Mr Kolacz—No, you could not—not with this system. It is intended to detect the vessels that have a transponder on them, which is all vessels of 300 tonnes and over, mandated by the International Maritime Organisation.

Senator ABETZ—So fish poachers that operate in our southern oceans, who do not necessarily abide by international law, would not necessarily be picked up either.

Mr Kolacz—Not by this system. However, we have been asked by surveillance agencies about this issue, so we are looking to complement the system with a number of optically based satellites that could detect a vessel of two metres or greater. The next generation will likely have optical sensors so we can detect whether a vessel that is leaving Rotterdam and arriving in New York has turned off his transponder and has jumped 60 nautical miles in 30 seconds, which is

impossible. So out of the 600 vessels that arrive in New York we will be able to say, 'That's the one I'm going to investigate.' There are a number of opportunities.

Senator ABETZ—Very good. With what degree of accuracy are forest fires picked up? How big does the fire have to be? I assume if I light a match that would not be picked up.

Mr Kolacz—Probably not. I would have to defer to our science team; I am not familiar with that. I know that we have submitted proposals to the space agency that look at the ability to detect forest fires at an early stage, but I could not answer that question accurately at the moment.

Senator ABETZ—Right. I do not know what the situation is in Canada, but most of ours are through lightning strikes. You get a lightning strike, it smoulders away and then the weather turns dryer and you start getting a forest fire. That, of course, can happen in the middle of nowhere, and in those circumstances it is very hard to pick up a fire until it is a blazing—whereas, if we could pick it up in the early stages, an aerial dump of water could potentially put that out and save us a lot of damage. I think we lost over a million hectares last summer.

Mr Kolacz—It is the same in Canada. What I would say is that, apart from just forest fire detection, we are looking at systems that can identify where a fire is likely to occur—where there is a high density of biomass and where it is particularly dry—so that you know where to focus your resources even in advance. A lot of the activities, just like on the surveillance side, are to try and achieve prevention or at least have the forces in play to be able to very quickly deal with a situation that comes up. We have been looking at systems that deal with the amount of biomass and how dry a situation is and can even track storms so we are able to say: 'We had better look in this area because it has been very dry. We have weather conditions that are likely to contribute to a lightning strike; therefore, when this storm front passes over we're going to focus on this area so our response time is minimal.' Those are the kinds of scenarios you can do from space.

Senator ABETZ—All power and strength to you!

CHAIR—Thank you very much for coming in this afternoon and spending the time here.

Mr Kolacz—We appreciate the opportunity.

Committee adjourned at 12.45 pm