WHY CANADA NEEDS A TECHNOLOGY TRANSFER ACT

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Prepared by

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Please note, the 1993 Treasury Board "Award Plan for Inventors and Innovators" was rescinded in 2013/14.

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Background

Technology transfer from government laboratories to industry is increasingly being seen as an important element in a country's technological innovation infrastructure. This does not mean that all the scientific or technical work conducted in a government laboratory is or should be destined to result in new commercializable products or services. It does mean, however, that government laboratories have a contribution to make to the innovative activities of the industries in their countries. This contribution should not be at the expense of the internal research mandate of the laboratory. A 1989 OECD study of the changing role of government laboratories warns that, "the legitimate importance of the functions of transferring knowledge and know-how should not be overemphasized to the detriment of the research function proper. Knowledge and know-how have to be produced before they can be transferred, so the potential for high calibre research must be developed and maintained" (OECD, 1989). Echoing this concern, Bozeman and Coker (1992) warn, "the whole idea of increasing the commercial consciousness of the government laboratories must be treated with some caution, as there is potential that the new enterprising, entrepreneurial laboratories may lose their edge in basic research, or pre-commercial applied research". Thus technology transfer activities are not a substitute for strategic basic research but a complement that ensures the maximum utilization of results.

In the context of this paper, technology transfer is defined to be:

the managed process of transferring knowledge, expertise or hardware from an originator to an adopter in an organization that can maximize its value to the ultimate end-user.

In the US, legislative measures have been, and continue to be taken to encourage the transfer of technology from government laboratories to US industry. These include the establishment of a royalty based reward system for government inventors and the promulgation, since 1980, of various laws, legislative amendments, and transfer mechanisms that direct government agencies to take technology transfer seriously especially with small and medium sized enterprises (SMEs).

Canada, by most measures of R&D expenditures, under invests in technological innovation relative to its major competitors. Thus it is important that transfer of technology and knowledge generated in government laboratories be put to the maximum use, where possible, by the Canadian private sector. To-date, however, Canadian efforts to encourage technology transfer have been much more disorganized than in, for example, the US. Canada has a mixture of government statements, and "Acts" and Treasury Board policies that are either antiquated, poorly drafted, or in some cases, designed to undermine the effective transfer of technology from government laboratories to industry.

The lack of a coordinated effort to support technology transfer is resulting in confusion over ownership of intellectual property (IP), lack of consistent administration of rewards to inventors across government departments and agencies, questions about whether government senior management is really supportive of technology transfer, unnecessary fear over conflict of interest issues, and a "them" versus "us" attitude building up between government bureaucrats and Canadian industry.

The goal of this paper is to stimulate discussion on the need for a Canadian Technology Transfer Act (CTTA) and what that Act should cover. It gives an overview of pertinent US legislation, discusses Canadian Acts and policies and their shortfalls, and provides recommendations of what a Canadian Technology Transfer Act should contain to bring Canada's efforts to encourage the transfer of technology from government laboratories into the 21st century.

US Initiatives to Promote Technology Transfer to the Private Sector

US efforts to encourage technology transfer are generally based on legislation rather than departmental policies or government policy statements as is the case in Canada. The key elements of the most pertinent legislation, and the mechanisms that the US government has put in place to encourage technological innovation through technology transfer (Bozeman and Coker, 1992; Carr, 1992; Radosevich & Kassicieh, 1993; Mings, 1994, Allen, 1996) are:

Bayh-Dole Act of 1980 [Patent and Trademarks Law Amendment, PL 96-517]

The purpose of this Act is to promote the involvement of small business and non-profit organizations in patenting inventions arising from federally funded R&D.

It allowed small businesses and non-profits to retain title to federally funded inventions.

Stevenson-Wydler Technology Innovation Act of 1980 [PL 96-480]

The purpose of this Act is to promote technological innovation for US economic, environmental, and social goals.

The Act:

- required large federal laboratories to establish an Office of Research and Technology Application (ORTA) to facilitate technology transfer, and for agencies to earmark 0.5% of their R&D budgets to support technology transfer activities. Agencies also had to develop a five year strategic plan for technology transfer;
- established the Center for the Utilization of Federal Technology to coordinate the ORTAs; and
- made technology transfer a mission of the national laboratories.

Presidential Memorandum on Government Patent Policy [1983]

This allowed all contractors to claim rights to technologies developed under a federally funded grant, contract, or cooperative R&D agreement. In effect, it extended to all contractors the rights previously given to small business and non profit contractors in the Bayh-Dole Act.

Amendment to the Bayh-Dole Act, 1984

This amendment allowed non-profit (including university) operated Government Owned, Contractor Operated (GOCO) facilities (excluding those involved in naval nuclear propulsion or weapons-related research) to retain title rights to technologies they developed, and license the technology without having to go through the funding agency (i.e., allowed university GOCOs to enter into cooperative R&D agreements).

Federal Technology Transfer Act of 1986 [Amendment to Stevenson-Wydler Act]

The purpose of this Act (PL 99-502) is to encourage federal laboratories to engage in cooperative R&D arrangements with state and local governments,

industrial organizations, industrial development organizations, and non-profit organizations, including universities, and licensees of federal inventions (i.e., it established the formal Cooperative Research and Development Agreement [CRADA] mechanism).

This Act:

- assured that public servants share in the royalties from the licensing of government technology; and makes each science and engineering professional employed by the US Government responsible for transferring technology;
- allowed federal laboratories to grant patent licenses or assignment rights to firms;
- established the Federal Laboratory Consortium for Technology Transfer (FLC) to facilitate technology transfer activities in federal agencies and improve access of SMEs to federal technology; and
- requires that laboratory directors give preference to small business in choosing CRADA partners and in licensing patents.

Executive Order 12591 of 1987 [Facilitating Access to Science and Technology]

This order directed federal agencies with government operated laboratories to delegate authority to the laboratories to license, assign or waive intellectual property (IP) rights developed under cooperative arrangements (i.e., to encourage large businesses to obtain title to inventions that resulted from joint research).

It requires technology access and IP protection to be considered in negotiating R&D agreements with foreign individuals or governments.

Omnibus Trade and Competitiveness Act of 1988

This act redesignated the National Bureau of Standards as the National Institute of Standards and Technology (NIST) and made NIST responsible for assisting industry in technology development necessary to improve manufacturing processes.

It established NIST's Advanced Technology Program that assists businesses in the commercial application of generic research results and the refinement of manufacturing technologies.

National Competitiveness Technology Transfer Act of 1989

The purpose of this Act is to enhance US national security by promoting technology transfer from GOCOs to the private sector, and by enhancing collaboration between universities, the private sector, and GOCO laboratories in order to advance the development and commercialization of technologies with commercial potential.

The Act:

- authorized the Department of Energy's GOCO laboratories to enter into CRADAs on the same basis as its government owned, government operated laboratories (GOGOs) (i.e., for-profit contractors could enter into CRADAs);
- allows directors of national laboratories to obtain title to and license IP developed under collaborative agreements; and
- allows the laboratory to protect trade secrets, privileged or confidential commercial and financial information, as well as data developed under joint R&D agreements, for five years (i.e., exceptions from the Freedom of Information Act).

Technology Transfer Commercialization Act of 1999 [Proposed]

The purpose of this Act (H.R. 209) is to improve the ability of federal agencies to license federally owned inventions.

In particular, this proposed legislation is to provide federal laboratories with improved ability to license federally-owned inventions, either as stand-alone inventions, or by including the technology as part of a larger package under a CRADA (i.e., offers the ability to bundle licenses).

It also calls for the authorization of exclusive or partially exclusive licenses, subject to a 15 day public notice of intent to award such a license.

The various amendments and improvements over the years were designed to overcome problems that the drafters of the earlier acts did not anticipate, and the reluctance of the Department of Energy to go along with aspects of the various acts and amendments. For example, early legislation did not allow for exclusive licenses. Without the protection of an exclusive license, companies were not willing to invest the sometimes considerable sums of money necessary to develop a fledgling technology into a commercializable product. As a result technology with commercial potential was not being picked up by the private sector.

Other problems noted by observers of the technology transfer activities of government laboratories over the years included ORTAs not being adequately staffed, ORTAs focusing only on technologies already "on-the-shelf", some ORTAs were used as dumping grounds for people that the organization really had no further use for and thus had inadequate technical backgrounds; and inadequate efforts to transfer technology to small businesses. A 1994 study of the Department of Defense did not find a single case where a DOD ORTA had been involved in successful technology transfer (Spivey, Munson and Flannery, 1994).

It was not until the promulgation of the Federal Technology Transfer Act of 1986 that some government agencies began to take technology transfer seriously. This Act ensured that government agencies could not avoid technology transfer activities. Even regulatory agencies, such as the Food and Drug Administration, were not exempt from the Act, though many of their scientists were worried about conflict of interest issues arising if they were seen to be working too closely with the private sector.

The impact of these acts and revisions on encouraging the commercialization of government technology can be seen in the increase in licensing revenues received by US government agencies. In 1990 revenues from licenses from approximately 700 laboratories reached \$9.7 million. Although there are no up-to-date statistics available at the moment, it is believed that some US science-based government agencies earn anywhere between one and five million per year, with the National Institutes of Health being an exception, earning approximately \$39 million in 1998. In Canada, government departments and agencies earned approximately \$7 million in 1997/98.

In this short overview of US legislation, one thing is clear. US legislators, prompted no doubt by industry, are quite proactive in considering technology transfer as an important tool to support and improve the US economy. They see the value in trying to "get it right". The US Congress, in its review of HR 209, for example, states: "the technology transfer process *must be made 'industry friendly'* for companies to be willing to invest the significant time and resources needed to develop new products, processes, and jobs using federally funded inventions" (http://thomas.loc.gov). This is in sharp contrast to Canadian legislators who face only sporadic pressure from Canadian industry and have never had to discuss, debate or otherwise substantively deal with any technology transfer issues in Parliament in the past twenty years.

Cooperative Research and Development Agreement (CRADA)

Authorized by the Federal Technology Transfer Act of 1986, this mechanism was to improve the way in which federal agencies transfer commercially useful technologies to the private sector.

A CRADA is an agreement between one or more federal agencies and one or more non-federal parties under which the Government provides people, services, facilities, equipment, intellectual property, or other resources with or without reimbursement, **but not funds** to non-federal parties, and the non-federal partners provide funds, people, services, facilities, equipment, intellectual property or other resources toward the conduct of specified research or development efforts that are consistent with the missions of the laboratory. The CRADA is deemed to be different from procurement contracts, cooperative agreements, and grants so that activities conducted under a CRADA fall outside normal procurement, competition, and Freedom of Information rules and regulations. IP provided by the Government is on an "as is" basis.

An important aspect of CRADAs is the disposition of intellectual property resulting from the CRADA activity. As a general rule, any inventions made solely by the non-federal party will be owned by that party; any inventions made solely by federal laboratory employees will be owned by the Government; and any jointly made inventions will be owned jointly by the collaborating party and the Government. The Government can agree, in advance, to grant an option to the collaborating party to license any inventions made by federal employees under the CRADA without having to make such licensing opportunities available to third parties. In those cases where the non-federal, collaborating party owns an invention made under a CRADA, the Government shall be entitled to a non-exclusive, irrevocable, worldwide, royalty-free license to practice and have practiced for or on its behalf the invention made under the CRADA.

A recent change to CRADA legislation took place in March of 1996 when Congress passed Public Law 104-113, the *National Technology Transfer and Advancement Act of 1995*".

Key changes in the law were that the maximum amount of money a public servant can earn in any one year from royalties was increased from \$100,000. to \$150,000. and any surplus funds, after payments to individuals, could be used to support further R&D activities.

The following is the text of a key section (Section 14 (1)) of the new law which is pertinent to the theme of this paper [emphasis added by this author].

(1) Except as provided in paragraphs (2) and (4), royalties or other payments received by a Federal agency from the licensing and assignment of inventions under agreements entered into by Federal laboratories under Section 12, and from the licensing of inventions of Federal laboratories under Section 207 of Title 35, United States Code, or under any other provision of law, shall be retained by the laboratory which produced the invention and shall be disposed of as follows:

- (A)(i) The head of the agency or laboratory, or such individual's designee, shall pay each year the first \$2,000., and thereafter at least 15% of the royalties or other payments to the inventor or co-inventors.
- (ii) An agency or laboratory may provide appropriate incentives, from royalties, or other payments, to laboratory employees who are not an inventor of such inventions but who substantially increased the technical value of such inventions.
- (iii) The agency or laboratory shall retain the royalties and other payments received from an invention until the agency or laboratory makes payments to employees of a laboratory under clause (i) or (ii).
- (B) The balance of the royalties or other payments shall be transferred by the agency to its laboratories, with the majority share of the royalties or other payments from any invention going to the laboratory where the invention occurred. The royalties or other payments so transferred to any laboratory may be used or obligated by that laboratory during the fiscal year in which they are received or during the succeeding year:
- (i) to reward scientific, engineering, and technical employees of the laboratory, including developers of sensitive or classified technology, regardless of whether the technology has commercial applications;
- (ii) to further scientific exchange among the laboratories of the agency;
- (iii) for education and training of employees consistent with the research and development missions and objectives of the agency or laboratory, and for other activities that increase the potential for transfer of the technology of the laboratories of the agency;
- (iv) for payment of expenses incidental to the administration and licensing of intellectual property by the agency or laboratory with respect to inventions made at that laboratory, including the fees or other costs for the services of other agencies, persons, or organizations for intellectual property management and licensing services; or
- (v) for scientific research and development consistent with the research and development missions and objectives of the laboratory.

(C) All royalties or other payments retained by the agency or laboratory after payments have been made pursuant to subparagraphs (A) and (B) that is unobligated and unexpended at the end of the second fiscal year succeeding the fiscal year in which the royalties and other payments were received shall be paid into the Treasury.

GOCOs are also obligated to follow these new rules.

In the early years of the CRADAs, a major complaint was the long time required to negotiate an agreement that resulted in some windows of opportunity being missed.

The Government does not, in any way, warrant or guarantee the performance of any product or process that results from a CRADA and private sector partners cannot produce advertising that implies any type of government approval for their products, etc.

Americans appreciate that technology transfer from government laboratories is an important resource to their economy. There are approximately 5,000 CRADAs in place at the present time. As Dan Brand, Chair of the Federal Laboratory Consortium said in a statement to a Senate Commerce subcommittee on Science, Technology and Space, "Corporate America is increasingly seeking out government laboratories to fill their basic research needs. Therefore, stability in our long-term government R&D will provide security for a business environment that 'pulls' technologies into the market place" (http://www.federallabs.org).

Canadian Initiatives to Promote Technology Transfer to the Private Sector

"We must do a better job of getting the results of federal government research out of our labs and research facilities and into the commercial marketplace" - The Liberal Plan, 1997

Canada has relied much less on legislation and more on government policies and statements to promote technology transfer. However, even where there is legislation, departments and agencies have the ability to opt out and not adhere to the purpose of the legislation (e.g., awards to inventors). Canadian efforts have not had the theme of making technology transfer to the private sector "business friendly". On the contrary, the general focus has been on making technology transfer "government-friendly" with ease of bureaucratic administration being uppermost in the minds of the public servants. Atomic Energy of Canada, for example, is exempt from the awards policies.

Public Servants Inventions Act, and Regulations of 1973

In 1973, the Federal Government enacted the Public Servants Inventions Act (PSIA) to encourage the disclosure of inventions made by public servants.

Under this Act, awards to a public servant inventor can be made, but they are subject to Ministerial approval. Section 10 states: "Subject to the regulations, the appropriate minister **may** authorize the payment of an award to a public servant who makes an invention that is vested in Her Majesty by this Act, in such amount as the appropriate minister and the public servant may agree on or as the appropriate minister determines".

The accompanying Public Servants Inventions Regulations elaborated on the awards that could be made. Under the title, "Awards to Inventors" Section 13 states:

- (1) In addition to any other award that may be paid under this section in respect of an invention vested in Her Majesty, an award may be paid by the appropriate Minister to each inventor of the invention:
 - (a) upon the filing by Her Majesty of the first application for a patent for the invention in the patent office of the first country in which an application for a patent for the invention is filed by Her Majesty, in the amount of:
 - (i) \$50. if there is only one inventor, or
 - (ii) \$95. divided by the number of inventors, if there is more than one inventor; and
 - (b) upon the issuance of the first patent in respect of the invention that is issued by the first country that issues a patent in respect of the invention, in the amount of
 - (i) \$50. if there is only one inventor, or
 - (ii) \$95. divided by the number of inventors, if there is more than one inventor.
- (2) Where any money is received by Her Majesty upon the sale, license or other disposal of an invention vested in Her Majesty by the Act, an award or awards may be paid to the inventor, based on the total amount from time to time so received, but such award or awards shall not in the aggregate exceed 15% of the amount so received.

(3) Where Her Majesty has made use of an invention vested in Her Majesty by the Act, an award or awards may from time to time be paid to the inventor, but such award or awards shall not in the aggregate exceed the sum of \$5,000. except with the approval of Treasury Board.

Subsection (5) allows for the payments under both subsections (2) and (3), where an invention is used both internally by the Crown, and also results in revenues to the Crown. Subsection (6) allows for the \$5000. payment to an inventor for an invention with potential value to the Crown in some manner, for example, the trading of some Crown-owned IP for someone else's IP where no actual funds exchange hands.

From the wording of this Act, it is clear that payments are to be made only to the inventor(s), who for the purposes of award, is the person(s) named in the patent application.

As will be noted later, the Governor in Council, in 1993, authorized the revocation of Section 13 to allow for the removal of the awards scheme from the regulatory environment to a policy format in order to make substantial changes to the awards scheme.

In addition to the awards schedule, the PSIA states that public servants are duty-bound to disclose any intellectual property they develop. Under the conditions of the Act, an invention made by a public servant:

- while acting within the scope of his/her duties or employment, or
- with facilities, equipment or financial aid provided by or on behalf of Her Majesty; or
- that resulted from or is directly connected with his/her duties or employment;

is owned by the Crown.

"Title to Intellectual Property Arising Under Crown Contracts" [1991]

The Treasury Board policy of September, 1991, "Title to Intellectual Property Arising Under Crown Contracts", applies to the intellectual property arising from research and development carried out in the course of work done under contracts issued for the procurement of goods and services.

This Policy eliminates the presumption of Crown ownership of intellectual property resulting from such contracts. Thus, "when reviewing intellectual property aspects in preparation for the award of a contract involving R&D, departments are to start with a presumption that contractors will take title to intellectual property".

The purpose behind this policy was to put the technology firmly into the hands of those who are best equipped to commercialize it, namely the private sector. This policy would also put Canadian companies on the same footing as their US counterparts in their dealings with their government.

The guiding principles for application of the Policy state that regardless of with whom title to intellectual property vests, departments are responsible and accountable for ensuring technology and intellectual property developed under Crown contracts can be exploited by the private sector for commercialization. If title vests with the Crown, granting of a licence should not be unreasonably refused.

The following six factors are to be used when determining exceptions to the presumption of contractor ownership (that is when the Crown might hold title to the intellectual property when negotiating contracts):

- 1. Title to background technology vests with the Crown and the contractor is simply adding to the technology package by providing a service;
- 2. Prior obligations to a third party or parties (such as a research partner or research consortium) would preclude the title vesting with the contractor;
- 3. The contractor has no intention or capability of pursuing commercialization in a timely manner in Canada;
- 4. National security;
- 5. The main purpose of the work is to generate knowledge and regulatory information for public dissemination; and
- 6. Mutual agreement.

A major difference between this policy and those in the United States, is that with the exception of US national security issues, the US contractor, not the public servant, makes the decision on whether to elect to retain the IP ownership. If the contractor elects to retain the ownership, the US government obtains a royalty-free, fully paid-up license in perpetuity, to practice and make use of the transferred technology in a non-commercial manner. In Canada, the public servant makes the decision on who is to own the foreground intellectual property.

An evaluation of the degree of compliance of Canadian government departments to this policy in 1995 found that most were, in effect, ignoring the policy by using one of the exceptions to retain Crown ownership (Clarke and Reavley, 1995). The major reason for retaining ownership was to

protect sources of income (IP royalties and license fees) in the chronically under-funded Canadian government laboratories.

The lack of compliance with the 1991 Treasury Board policy was a source of major concern and confusion to many private sector contractors, especially those dealing in computer hardware or software.

As noted below, this policy was replaced by a revised policy in October of 2000 to overcome some of the compliance problems noted by the consultants.

"Retention of Royalties and Fees from the Licensing of Crown-Owned Intellectual Property" [1993]

When the intellectual property management agency of the Canadian government, Canadian Patents and Development Limited (CPDL) was disbanded in 1993, all of the intellectual property that they had previous managed (licensed and marketed) was returned to the originating government department or agency to manage.

On June 2, 1993, the Treasury Board approved a submission from the Minister of Industry, Science and Technology (now Industry Canada) and the Minister of Science which allows departments and agencies to retain all revenues arising from the licensing of Crown-owned intellectual property. These revenues "are intended to be used toward the costs associated with incentives awards for technology transfer and other technology transfer activities undertaken by the department or agency".

A Treasury Board memorandum of July 19, 1993 on the subject of *Retention of Royalties* and *Fees from the Licensing of Crown-Owned Intellectual Property* states that "Departments and agencies are now authorized to receive, through Supplementary Estimates, an annual appropriation equal to all revenues arising from the licensing of Crown-owned intellectual property which the department or agency remitted to the Consolidated Revenue Fund in the previous fiscal year".

This additional source of funds for departments and agencies was to compensate for the additional expenditures faced by departments having to take on the licensing and patenting activities formerly undertaken by CPDL. The policy does not mention use of any surplus funds to support a department's R&D activities or to set up awards for public servants not engaged in technology transfer.

Unfortunately the drafters of this policy, by referring to "Crown-owned" intellectual property rather than "Crown-developed" intellectual property, put this policy in direct conflict with the intent of the 1991 policy on IP ownership from procurement contracts. With the ongoing reductions in

funding of government laboratories, this policy gave the laboratories justification to retain as much IP as possible, especially any that had commercial potential.

"Award Plan for Inventors and Innovators" [1993]

This Treasury Board policy, effective June 8, 1993, revises the payment schedule as set out in the Public Servants Inventions Act and is designed to encourage government inventors to pursue, through the transfer of technology, the commercialization of their inventions and to promote within the government laboratories, the practice of collaborating with Canadian industry.

The authority to make awards under this revised plan is still the Public Servants Inventions Act:

In accordance with Section 10 of the Public Servants Inventions Act, "the appropriate Minister may authorize the payment of an award to a public servant who makes an invention that is vested in Her Majesty". Payments to the inventor may be made for the life of the inventor but must cease at the inventor's death.

The amount of an award for inventions used by the Crown remains at a maximum of \$5,000. unless permission is received from Treasury Board to exceed this amount.

The major change is in the amount of the awards made from royalty or license fees which are considered to be **ex gratia awards** and subject to reconsideration at any time.

Under the new formula, the amounts to be awarded for each invention should be based on the revenues from the invention (i.e., royalties, license fees, etc.) and should be:

- 1. not less than 15% of revenues, and
- 2. not more than:
- ▶ 100 % of revenues where revenues are \$1,000. or less, or
- the greater of \$1,000. or 35% of revenues where revenues are greater than \$1,000.

If there is more than one inventor for any one invention; the award should be divided among the eligible inventors.

Awards are to be made annually based on revenues received, but no individual is to receive an annual award or awards derived from a single invention that exceeds the highest salary current at the time of payment of the SE-RES 2 classification (approx. \$73,400. at present).

Besides increasing the amounts of the awards, the policy is intended to expand the class of recipient to include the people who develop the invention into a more commercializable form and assist in marketing the technology to an adopter. These people are referred to in the title as "innovators". Thus it is the intent to reward the whole innovation team, not just the inventors.

Unfortunately, "innovators" are not defined or even mentioned in the body of the policy. They are also not mentioned or defined in the Public Servants Inventions Act from which this policy draws its authority. Hence there appears to be no legal authority to pay the downstream developers and other people who contribute significantly to the commercialization of the government developed technology, despite this being a good management practice. Several departments are turning a "blindeye" to this legal question and are awarding 20% of the allowable 35% to the key contributors or innovators with the traditional 15% continuing to go to the inventors. The National Research Council, for example, includes their marketing/business development people in their award scheme.

At the moment, only four or five public servants have received awards at the maximum allowable amount. In 1997/98, the Communications Research Centre of Industry Canada awarded \$312,000 to 54 inventors; 1998/99 - \$211,000. to 62 inventors; 1999/2000 - \$392,000. to 46 inventors; and in 2000/2001, \$\$766, 585. to 68 inventors. The National Research Council awarded \$1,689,717.00 to 253 recipients. (Note that the NRC unlike any other government department includes their marketing people in their awards program.)

"Title to Intellectual Property Arising Under Crown Procurement Contracts", [2000]

This is not a new policy but a revision to the earlier 1991 TB policy dealing with the question of who owns the IP that results from a Crown procurement contract.

This revision continues the elimination of the presumption of Crown ownership of new intellectual property (called Foreground IP) arising from procurement contracts (i.e., when preparing a request for proposal, a department is to start with the presumption that the contractor will take title to any resulting intellectual property). The policy is only to be applied to those procurement contracts, of any monetary value, that will result in the creation of new intellectual property (e.g., a new instrument, a new drug, new software, a written report, etc.). Thus when preparing a Request for Proposal, a determination of whether any new IP will be developed must be made. If no new IP will be developed, then the policy is not to be applied.

Like its 1991 predecessor, this new version of the policy provides for Crown ownership of any resulting IP under specific circumstances or conditions.

Under a Crown Procurement Contract, the Crown may own the Foreground IP for the following reasons (Section 6 of "Title to Intellectual Property Arising Under Crown Contracts"):

- 1. National Security (6.1)
- for example, wanting to control the further development and distribution of a new virulent biological warfare agent
- 2. Where statutes, regulations, or prior obligations of the Crown to a third party or parties preclude Contractor ownership of the Foreground (6.2)
- for example, provincial and federal governments are funding a project and the prior agreement is for the Crown to own the Foreground IP
- 3. When the Contractor declares in writing that he/she is not interested in owning the Foreground (6.3)
- for example, the contractor is an R&D establishment only and has no interest in or capability to commercialize any resulting Foreground IP
- 4. Where the main purpose of the Crown Procurement Contract, or of the deliverables contracted for is, (6.4):
 - 4.1 to generate knowledge and information for public dissemination (6.4.1)
 - 4.2 to augment an existing body of Crown Background IP as a prerequisite to the transfer of the augmented Background IP to the private sector, through licensing or assignment of ownership (not necessarily to the original Contractor), for the purposes of commercial exploitation (6.4.2)
 - 4.3 to deliver a component or subsystem that will be incorporated into a complete system at a later date (not necessarily by the original Contractor) as a prerequisite to the planned transfer of the complete system to the private sector (not necessarily to the original Contractor), through licensing or assignment of ownership, for the purposes fo commercial exploitation (6.4.3)
- 5. Where the Foreground IP consists of material subject to copyright, with the exception of computer software and all documentation pertaining to that software (6.5)

There is also a sixth general exception called the "**Treasury Board Exception**". The Crown may take ownership of any Foreground IP in circumstances where it is justified but not provided for in Section 6 of the Policy, and the Responsible Department has sought and obtained Treasury Board approval for such an exception. Use of this exception must be obtained through a Treasury Board Submission.

The exceptions are only to be applied (i.e., Crown retains IP ownership) if obtaining a license from the Contractor is not adequate for the Crown to fulfil its objectives. If an exception is going to be invoked, this information must be included in the Request for Proposal and state which exception is being used.

A major difference between the earlier 1991 version and the new 2000 policy is that if exceptions 6.4.2 or 6.4.3 ("fragmentation exceptions") are invoked, any licenses to the retained intellectual property must be royalty-free, to anyone. The Crown may, however, charge a license fee for the complete technological package.

Intellectual property developed in the course of a collaborative R&D agreement falls outside of this IP ownership policy and ownership is to be decided on a case-by-case basis. IP developed under a grant is the property of the grant recipient or their employer.

Whether this new policy will result in greater compliance with the concept of contractor ownership is debatable. This pessimism about the effectiveness of the new version of the 1991 policy to encourage the assignment of IP ownership to a contractor is prompted by a comment made by a senior government manager who stated that he was satisfied with the new version because the exceptions were so large, "he could drive a truck through them". Presumably this means that his department can continue their policy of "Crown pays, Crown owns" without any interference from outsiders.

As noted elsewhere, in the U.S., with the exception of national security issues, the contractor, not the public servant, makes the decision on whether or not to elect to retain IP ownership. If the contractor elects to retain the ownership, they must undertake to exploit the technology in a timely fashion and must provide the U.S. government with a royalty-free, fully paid-up license in perpetuity, to practice and make use of the transferred technology in a non-commercial manner.

Other Sources of Guidance to Technology Transfer/IP Management for Canadian Government Departments and Agencies

The following, while not Treasury Board policies or acts of parliament, are intended to guide and influence the management of the technology transfer process and IP management in government departments and agencies.

Science and Technology for the New Century

In 1996, the Canadian government produced a series of reports under the general title of "Science and Technology for the New Century" that outline the government's plan to "allow Canada to take advantage of the worldwide economic shift to knowledge-based industries" (Gov. of Canada, 1996). Among other things, the plan calls for improved management of science and technology (S&T) activities within the federal government. One aspect of this call for improvement is to encourage better management and commercial exploitation of intellectual property developed in government laboratories. More specifically, the Summary of the reports contains a section entitled, "Annex: Commitments to Action" which states, among other things:

- The transfer of knowledge and technology is an explicit objective of federal S&T, and departments and agencies will be closely evaluated on their efforts in meeting it.
- All science-based departments and agencies will develop strategies for promoting partnerships and collaborative S&T arrangements with industry, the provinces, universities and other stake holders.
- Federal departments and agencies will take measures to improve access to their facilities and encourage an open-door approach to others engaged in scientific research.
- The federal government will start immediately to review its intellectual property policy in order to determine what improvements can be made to increase opportunities for commercialization and partnerships with the private sector.
- The transfer of knowledge and the sharing of scientific information and data with Canadian researchers, schools, universities, libraries and industry will be a key function of all federal departments and agencies.

The intent of these commitments is to make technology transfer an intrinsic part of the mission of every science-based government department and agency.

Unfortunately, no mechanism has been put in place to monitor the degree of compliance of the government departments and agencies in meeting these commitments (e.g., assessing the level of resources committed to technology transfer activities).

Of more importance, statements in government publications really carry no weight with most bureaucrats. As noted above, even Treasury Board policies can be ignored with relative impunity as there are no resources or interest in monitoring and ensuring compliance.

FPTT Guiding Principles for the Management of IP Issues (Draft)

The Federal Partners in Technology Transfer (FPTT), an interdepartmental committee of technology transfer officials, have outlined some non-binding guiding principles for the management of intellectual property within the Canadian Federal Government. Although these are not official government policy, they address a major concern of the FPTT of balancing the need for consistency of management of IP throughout the government with having practices that respect individual departmental and agency mandates.

The purpose of the draft guidelines is to ensure that intellectual property will be managed in a way that will maximize the socio-economic benefits for the country. If commercial exploitation of the IP is possible, this will be best achieved by the transfer of the IP to the private sector.

The guiding principles are:

- 1. IP must be managed as a tool to help departments fulfil their mandates. This is its primary function. No other consideration can equal or surpass the obligation to support the departmental mandate.
- 2. When government transfers IP to the private sector for commercialization, the objective is to maximize socio-economic benefits for Canadians.
- 3. When split ownership of IP occurs, contractual arrangements must be managed so as to maximize possibilities for commercial exploitation. This will generally translate into efforts to focus control of the IP into the hands of a single player for a given application of the IP.
- 4. To facilitate technology and IP transfer to the private sector, government will use generally accepted industrial standards and norms whenever possible.
- 5. IP developed in collaborative R&D with industry generally stands the best chance of being effectively transferred to the private sector and commercialized. This mode of technology transfer should be favoured in the management of IP. In instances where government R&D laboratories do not have a mandate to collaborate directly with firms, licensing of IP should be the favoured option.

- 6. For departments and agencies that have an industrial development or support mandate, project selection should involve careful consideration of the market potential and value of the IP being targeted. Managers of IP should be involved in this assessment.
- 7. IP may be embodied in various forms, including patents, copyrights, "know-how", trade secrets, etc. All forms of IP must be properly managed and respected.
- 8. IP management is an integral part of the R&D process. It helps define the optimum research strategy. Managers of IP should be part of R&D teams during the entire course of project development
- 9. Human resource training is an essential component of IP management. It leads to improved R&D strategy and reduces the risk of premature disclosure. Departments must provide such training for scientists and their managers.
- 10. The importance of contributions to the creation, management and exploitation of IP must be properly reflected in job descriptions and performance evaluations of employees.
- 11. Government-created or -sponsored IP is an asset to the Crown. As such it must be treated with the same care and respect due to physical Crown assets. In particular, care must be taken to recognize the value of IP at the early stages of its development.
- 12. To maintain employment equity, rewards to inventors and innovators in government employment must be made according to uniform principles established by the Treasury Board. Appropriate rewards should be given to the employees directly responsible for the development of an IP and to members of the support team that contributed to the work even if they were only indirectly involved in the discovery.
- 13. The management of IP involves flexible business skills such as deal-making that are not readily translated into rules and guidelines. Given the complexity and diversity of IP issues, sharing of knowledge and experience across departments through mentoring and information exchange is considered to be an essential means for training and for management improvement.
- 14. When it awards an exclusive licence thereby providing a monopoly to a firm, government should reserve the right to continue to use the invention in question for its own internal non-commercial purposes.

- 15. The continuance of licenses should be conditional upon the licensee achieving predetermined performance milestones so that government can recover its property if the licensee fails to properly develop and exploit the IP.
- 16. Licensees should be prohibited from assigning licenses to third parties without the consent of government since such an action may conflict with the obligation to maximize the use of the IP for the socio-economic well-being of Canadians.

Although these guidelines are helpful in managing IP, no department or agency is under any obligation to follow them.

Problems with the Existing Approach

The existing Canadian approach to promoting technology transfer from government laboratories to the private sector leaves too much power in hands of senior bureaucrats with the result that the inventors/innovators of the successfully commercialized technology can be cut out of their fair share of the rewards of success. In addition, the senior bureaucrats can also dictate to the private sector adopter any and all conditions associated with the transfer of the technology even when the private sector adopter has been a player in the development of the technology via a partnership or contractual arrangement. In effect, even if the private sector puts up the majority of resources in a project, the government can refuse to assign them the intellectual property or even grant them a license.

A major deficiency of the many policies and procedures put forward by the Canadian government is lack of concern for the private sector companies that are responsible for turning the government developed technology into commercializable products or services. Except for the 1991 and subsequent 2000 revised TB policy that attempts to encourage departments and agencies to assign IP ownership rights to contractors, concern for the rights of contractors in their dealing with government on technology transfer issues have been ignored by most government departments and agencies. For example, if a prospective contractor wants to challenge a department's decision to retain ownership of IP that will be developed under a contract, the act of challenging the department's stand can be interpreted as the contractor's bid being unresponsive to the "Request for Proposal" put out by the department, and the contractors bid is set aside. There is no appeal to a third party.

During the assessment of the implementation of the 1991 Treasury Board IP ownership policy, numerous contractors interviewed complained about attempts by the government personnel to get them to assign ownership of their background technology over to the Crown (Clarke and

Reavley, 1995). There was (and still is) no third party to whom they could voice their concerns. Small companies, anxious to do business with a department, had to comply or risk being blackballed for future contracts. Large firms, of course, wielded more power and could safely refuse to give up control of their IP.

As noted above, contractors that are involved in collaborative R&D projects with government departments, into which they put substantial resources, do not even have the right to obtain a license to any resulting IP. If the government department retains ownership of foreground IP, it could license the IP to a third party claiming, rightly or wrongly, that the initial contractor does not have the capability of successfully commercializing the technology. Canada does not have the equivalent of CRADA legislation to protect the private sector partner from any arbitrary departmental decisions.

Some departments and agencies have a rather hypocritical attitude on IP ownership. If the department pays a private sector firm to develop a technology for it, the department takes the position that the Crown owns any resulting IP; however if a private sector firm pays a government laboratory to develop a technology for it, the government department or agency still takes the position that the Crown owns the resulting IP. "Heads I win, tails you lose".

In effect, there is no "Technology Transfer Bill of Rights" for private sector contractors. Government bureaucrats take the attitude that they know best what is good for Canada in commercializing government technology with the result that the private sector is beholden to the good will of the bureaucrats in their technology transfer dealings.

The following are other major problems associated with the Canadian government's present approach to encouraging technology transfer:

- the 1973 Public Servants Inventors Act is out-of-date and only authorizes awards to inventors, rather than the whole innovation team and/or software developers;
- in the past, most departments and agencies did not follow the intent of the 1991 Treasury Board policy on IP ownership and were using the exceptions liberally to retain IP ownership; it is too soon to tell if this has changed as a result of the new policy;
- awards to inventors and innovators under the 1993 TB policy are discretionary. This
 has resulted in some subunits in some departments not wanting to make any awards.
 Inventors and innovators have no legal right to claim a percentage of the revenues
 from successfully licensing their inventions, and must depend on the goodwill of their
 senior management;

- the 1993 TB Awards Plan to Inventors and Innovators does not define what is meant by an "innovator" and relies on the PSIA which makes no mention of "innovators" for its authority to pay out monies; in other words, payments to innovators or software developers are not legally sanctioned;
- with the exception of the National Research Council, it is not apparent that any of the science-based government departments are following the 1993 inventors awards policy and providing any IP financial awards to innovators;
- individual departments have been forced to define what is meant by "innovators", which has resulted in inconsistencies across the public service;
- there is no consistency across the public service in the percentage of royalties paid out to inventors (e.g., some pay 35%, others 25% and some only 15%);
- inventors may have to wait several years after obtaining a patent to receive any monetary reward, and payments cease on the death of the inventor;
- in some departments, monies earned from inventions are not returned to either the originating R&D unit, or even to the R&D branch. Involvement in technology transfer activities is, therefore, a net drain on resources in the originating laboratory;
- the 1993 Awards policy has a cap on the total amount of money a public servant can receive from one licensed patent (top of SE-RES 2) while the government has no cap on how much it can receive from a licensee:
- private sector companies, especially those involved in computers and software, are reluctant to be open with government about IP because of their fear that the government will try to claim ownership;
- there is no pool of money set aside to pay for the internal use of inventions, rewards must come from cash-strapped operating budgets with the result that few, if any, rewards for internal use have been made;
- there are no effective mechanisms to monitor the internal use of government developed inventions, especially if they are exploited in a department or agency other than the one in which it was developed. This can result in inventors not being aware of the exploitation or of any subsequent awards "owed" them;
- the distinction between internal use and external licensing of an invention and the
 resulting award is not justifiable; if the Crown obtains continuing benefits from the
 internal use of an invention, the Crown should make annual payments to the innovation

team that are commensurate with the savings accrued by the government. There should be no arbitrary cap of \$5,000., and payment should be for the time during which the savings are accrued;

- despite the government's verbal support for technology transfer as noted in the "Summary", departments continue to under-fund or under-resource the technology transfer activity and no extra dedicated funds have been made available from Treasury Board to support technology transfer activities;
- there is confusion over what procurement contracts fall under the new 2000 IP ownership policy, and it does not focus in on commercializable IP;
- Crown corporations such as Atomic Energy of Canada, which conducts considerable research and development, are exempt from many of the present policies, and in particular, the rewards to inventors policy; and
- no department or agency has the responsibility, or has assumed the responsibility for ensuring that the many IP or technology transfer policies or regulations are followed to the benefit of Canada, and has the authority to force compliance.

Additional study would result in more "problems" being identified and added to this list.

DISCUSSION AND RECOMMENDATIONS

In order to be seen to be fair to both the private sector adopters of government technology and the cash-starved government laboratories and their creative and innovative employees, Canada needs a Technology Transfer Act to replace the existing Public Servants Inventions Act, and the TB policies of 2000 and 1993 on technology transfer. This Act should apply to all government departments and agencies, including Crown corporations such as Atomic Energy of Canada Limited. The TT Act should reinforce the principle that technology transfer, and any subsequent commercialization, is a legitimate, valued activity that supports both the ability of public servants to fulfill the mandate of government departments and agencies, and wealth and job creation in the Canadian economy. The TT Act should mandate that adequate resources be assigned to ensure that the technology transfer activities are successful in encouraging the commercialization or transfer of government developed hardware, knowledge or expertise to those that can make good use of it. It should also call for each science-based department and agency to present to parliament an annual report of its technology transfer activities for the year. In this way, the public and politicians will be able to appreciate the contribution of the science-based departments and agencies to their socioeconomic well-being.

In particular, the Technology Transfer Act should deal with the following issues:

Ensure the Rights of the Non-Federal Partner or Technology Adopter

The private sector "partner" (or university partner) should be able to challenge, without prejudice, the decision of a department or agency to retain ownership of IP that results from a contractual arrangement. A challenge should not be construed as a "non-responsive bid" on an RFP. The department or agency should be made to defend its decision in writing, in full, instead of checking off a box beside one of the exceptions, as they do now. Any bidder who is not satisfied with the response of the department, should be able to argue their case to an independent third party whose decision would be final.

The use of the IP ownership exceptions on procurement contracts should be made public on an annual basis on both the department's web-site and in an annual report that should be subject to an audit by the Office of the Auditor General.

If a non-federal party contributes more than 50% of the resources in the development of a joint R&D project, that party should be assigned the ownership of the resulting foreground IP, at the beginning of the project. In the case of two or more non-federal parties, appropriate joint-ownership and cross-licensing agreements should be put in place. The government would receive a royalty free, world-wide, irrevocable license to practice the invention for non-commercial internal purposes.

Where the non-federal contribution is less than 50%, the non-federal partner should be assured of, at a minimum, a sole-to-application license, if not a sole license, at the beginning of the project.

Government departments and agencies should be expressly forbidden from making contract awards subject to the assignment of ownership of the contractor's background IP to the Crown, or subject to requiring a prospective contractor having to commit to a particular level of license or royalty fees prior to the development of the IP.

When the government licenses its own technology, it should be prepared to defend or assist the licensee in defending that license against infringement or patent challenges. To date, the Canadian government has a poor track record of supporting its licensees.

Mandatory Awards to the Innovation Team

At present, payments to inventors/innovators are discretionary and the amount of the award is subject to departmental or managerial interpretation. In at least one case in the past, this has resulted in a government departmental branch refusing to make any awards despite the branch earning revenues from the IP developed by its employees. This has been very upsetting to the employees.

The new Technology Transfer Act should mandate unequivocally that if license/royalty revenues are earned, payments to the innovation team **must be made**. There should be no uncertainty in the minds of the innovation team that they will share in the revenues generated by their innovation, if it is marketed successfully. This will reinforce the government's stated policy of encouraging its scientists and other technical staff to engage in technology development and transfer activities.

The Act should also state that appropriate monetary payment **must be made** if the Crown saves money or otherwise benefits from the internal use of an invention made by a public servant innovation team. Treasury Board should set aside a pool of money for this award as it is the government departments, as a whole, who benefit.

A process should be established by which the proportion of the reward to the original innovators can be modified, as other, not part of the original innovation team, add value to the originally developed intellectual property through later improvements that allow the technology to continue generating revenue. These later innovators or key contributors should share in the 20% of any ongoing IP revenues with the original inventors retaining their 15%, and the amount to the original innovators dropping accordingly in relation to the contribution of the new innovators.

The modifications to the 1973 PSIA that removed the awards for filing and issuing of patents were shortsighted. Many years can pass before a product/service based on an invention starts to

generate significant revenue streams. Thus in order to provide a more timely reward for the extra work that an inventor(s) has to do to facilitate the patent process, such as working with a patent agent or a technology transfer officer, or working with the adopting firm, the new Technology Transfer Act should re-establish the filing and patent issuing awards. A more appropriate level of award might be \$500. each for the named inventors upon the first filing, and \$500. each upon the first issuance of the patent. Controls should be put in place to limit the instances of "vanity" patents; patents filed solely for the purpose of their existence looking good on someone's C.V. In addition, the key people who will have to work with a licensee to further develop the technology should each receive an appropriate award (e.g., \$500.) on the signing of a license agreement. These key people may include the inventor and/or members of the downstream development team.

Return Royalties to the Laboratory of Origin

At present, there is no guarantee that monies earned by an R&D laboratory or sub unit will be paid to that unit. In some departments, monies earned from the licensing of IP does not even go to support technology transfer activities, but disappears in the department's general funds. The net result can be a drain on the laboratory resources without any compensation.

Under the present wording of the 1993 policy on Retention of Royalties, there is also no authority to use any surplus monies for mission-related R&D activities.

The potential for a negative impact on the morale of colleagues working beside a person who is receiving a large patent award can be greatly reduced if the laboratory in which the royalty recipient works also shares in the license revenue stream. Scientific/technical personnel who have no opportunity to develop commercial patents will see that they can still benefit from their colleague's success in developing profitable technology if the laboratory receives funds to support their R&D efforts to purchase new equipment, travel, etc. If, however, the revenues from royalties or license fees are swallowed up by headquarters and used for other purposes, then the risk of jealousies developing and reduction in cooperation or collaboration among laboratory personnel will grow.

Like the CRADA legislation, the new Technology Transfer Act should mandate that a considerable percentage of the funds earned from IP be returned to the originating laboratory to provide awards to others who cannot benefit from the commercialization of their work, to support technology transfer activities, or to support the R&D activities of the laboratory.

Legalize Royalty Payments to Innovators and Software Developers

To encourage public servants to invent, develop and commercialize government developed intellectual property, persons who make significant contributions to its successful transfer/commercialization should share in the reward with the inventor(s). Providing rewards and

incentives in some form to key contributors in the innovation team is a desirable goal. For example, shares of the royalty/license revenue stream would be divided among the inventor(s) and downstream developers of the IP. The marketing team may be included if their efforts have resulted in a better than expected revenue stream.

The Technology Transfer Act should clearly state that the whole team is to be rewarded. The definition of innovator or key contributor should be clearly defined in the reward scheme. Inventors should continue to receive 15% (of the 35%) of any royalty/license fee revenue with the remaining 20% divided among the rest of the team. Division of the award should be done in consultation with the whole team. Software development should be explicitly included either as a patented or copyrighted intellectual property, and an appropriate award scheme developed for it.

The Act should state that payments to downstream innovators or key contributors would not be extinguished by the death of the inventor(s).

The Act should also remove the cap on the total amount of an award that can be dispensed from the commercialization of a single patent to avoid the interpretation that the whole innovation team can share in a maximum of only \$74,200., the present SE-RES 2 top salary. Consideration should also be given to removing the SE-RES 2 award cap for individuals. Its existence smacks of socialism, not capitalism.

The new TT Act should continue the practice of making award payments, even if the public servant has left the public service.

At the moment, payments to the inventor cease upon their death. A practice not followed by the governments of the U.S., U.K Switzerland or Germany, or universities in Canada, the U.S., U.K., etc. An inventor or key contributor could die before significant revenues are received, especially in areas such as biotechnology which have very long regulatory lead times before commercialization. The new TT Act should clearly state that in the case of death of the inventor or innovator, IP revenue awards should continue to the inventor or innovator's estate, subject to revenues still being received by the Crown.

Provide Multi-year Awards for Internal Use of a Government Developed Invention

Government inventors/developers should receive monetary awards for the internal use of their inventions or software products for as long as the invention or software is providing substantive benefits to the Crown. There is no valid difference between benefit to the Crown through the receipt of external revenues from the licensing of new technology and benefit to the Crown through the use of new technology that saves money or allows for new needed services without increased expenditures.

The Act should include a clause that awards for internal use of government developed inventions should be on the same basis as external commercialization and a percentage of the identifiable savings to the Crown should be paid annually as long as benefits accrue to the Crown.

Departmental use of technology without notification of such use to the originating innovation team should be expressly forbidden.

Make the Award Process Completely Transparent

The recipients of royalty or license fee awards should understand how the government determines the amount they receive so that the positive effects of receiving financial awards are not undermined by uncertainty about whether the recipient is receiving a fair share. Therefore, the department should be obliged to provide recipients with a financial statement showing the basis of the award payments.

Inventors are usually in contact with the company that is licensing their technology and have a rough idea of the income the company receives as a result of their technology. If there are discrepancies between anecdotal information on company sales, and the financial statement provided by the department to the award recipient, this would signal the need for a further review.

Thus the new Technology Transfer Act should mandate that each department or agency that makes monetary awards to inventors or innovators must also provide a financial statement describing how the amount was calculated.

As the purpose of this paper is to promote discussion, it is certain that other points will be put forward that should be covered under a new Technology Transfer Act (e.g., should foreground IP ownership in formal cooperative agreements be modelled after the US CRADA legislation where each owns their own developed IP and jointly own jointly developed IP, should there be rewards for the transfer of public good technology that benefits society but does not generate revenues, etc.).

CONCLUSION

Canada's present approach to encouraging technology transfer has many deficiencies and the status quo is not adequate to meet the many challenges of smoothly integrating government laboratories into the national technological innovation infrastructure in the 21st century.

In order to encourage the utilization and transfer of technology and knowledge developed by government scientific/technical personnel, and to bring fairness, consistency and legitimacy to the technology transfer process in Canadian government departments and agencies, including Crown Corporations, Canada needs a Technology Transfer Act. This Act will replace the various out-of-date or "band-aid" efforts that have been put in place over the years to encourage technology transfer to the private sector.

The Technology Transfer Act must take into account the best interests not only of the government laboratories and their employees but also of the private sector. The private sector converts raw technology into cash flow, and its interests must be addressed and protected from arbitrary or self-serving decisions. Thus the development of a Canadian Technology Transfer Act must involve representatives from Canadian industry and academia, as well as public servants, if the resulting Act is to have wide acceptance. The Technology Transfer Act must be "user-friendly" to those who wish to make use of or commercialize government-developed technology or knowledge.

Without a new comprehensive Canadian Technology Transfer Act, government departments and agencies run the risk of alienating the better, entrepreneurial high technology companies because of their fear of being taken advantage of in IP license/ownership negotiations, and their own public servants who fear that they might not be treated fairly in the distribution of benefits resulting from their creative work. An Act would take away the potential for arbitrary decisions by senior bureaucrats.

A Technology Transfer Act will promote a "win/win" situation for both groups with the Canadian public being the overall beneficiary due to increased socio-economic benefits.

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