National Research Council Canada | Conseil national de recherches Canada

NRC · CNRC

Departmental Performance Report

National Research Council Canada

For the period ending March 31, 2006

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Minister of Industry

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Acronyms and Abbreviations

ACOA	Atlantic Canada Opportunities Agency
ALMA	Atacama Large Millimeter Array
ATLAS	A Toriodal LHC Apparatus
BBN	Bioproducts Business Network
BCC	Biomedical Commercialization Canada Inc.
CADC	Canadian Astronomy Data Centre
CBRN	Chemical, Biological, Radiation and Nuclear
CCHT	Canadian Centre for Housing Technology
CERN	The European Centre for Nuclear Research
CFHT	Canada-France-Hawaii Telescope
CRTI	CBRN Research and Technology Initiative
CTI	Competitive Technology Intelligence
DPR	Departmental Performance Report
DRAO	Dominion Radio Astrophysical Observatory
DRDC	Defence Research and Development Canada
FCHP	Fuel Cell and Hydrogen Program
FPTT	Federal Partners in Technology Transfer
FTE	Full-Time Equivalent
FY	Fiscal Year
GHI	Genomics and Health Initiative
HR	Human Resources
HRM	Human Resources Management
IP	Intellectual Property
IPF	Industry Partnership Facility
IPSO	Intellectual Property Services Office
ISAC-II	Isotope Separation and Acceleration Facility
IT	Information Technology
ITA	Industrial Technology Advisor
JCMT	James Clerk Maxwell Telescope
JWST	James Webb Space Telescope
LHC	Large Hadron Collider
LRP	Long Range Plan for Astronomy and Astrophysics
MEA	Membrane Electrode Assembly
MG	Management Level
MOU	Memorandum Of Understanding
MRI	Magnetic Resonance Imaging
MSE	Medium-Sized Enterprise
NIC	NRC Information Centre
NINT	National Institute for Nanotechnology
NMI	National Metrology Institute
NRC	National Research Council Canada
NRC-AMTC	Aerospace Manufacturing Technology Centre
NRC-ATC	Aluminium Technology Centre
NRC-BRI	Biotechnology Research Institute
NRC-CCBT	Centre for Commercialization of Biomedical Technology
NRC-CHC	Canadian Hydraulics Centre

NRC-CISTI	Canada Institute for Scientific and Technical Information
NRC-CNBC	Canadian Neutron Beam Centre
NRC-CPFC	Canadian Photonics Fabrication Centre
NRC-CSIR	Centre for Sustainable Infrastructure Research
NRC-CSTT	Centre for Surface Transportation Technology
NRC-GTERC	Gas Turbine Environmental Research Centre
NRC-HIA	Herzberg Institute of Astrophysics
NRC-IAR	Institute for Aerospace Research
NRC-IBD	Institute for Biodiagnostics
NRC-IBS	Institute for Biological Sciences
NRC-ICPET	Institute for Chemical Process and Environmental Technology
NRC-IFCI	Institute for Fuel Cell Innovation
NRC-IIT	Institute for Information Technology
NRC-IMB	Institute for Marine Biosciences
NRC-IMI	Industrial Materials Institute
NRC-IMS	Institute for Microstructural Sciences
NRC-IMTI	Integrated Manufacturing Technologies Institute
NRC-INMS	Institute for National Measurement Standards
NRC-INH	Institute for Nutrisciences and Health
NRC-IOT	Institute for Ocean Technology
NRC-IRAP	Industrial Research Assistance Program
NRC-IRC	Institute for Research in Construction
NRC-PBI	Plant Biotechnology Institute
NRC-SIMS	Steacie Institute for Molecular Sciences
NSERC	Natural Sciences and Engineering Research Council of Canada
OAG	Office of the Auditor General of Canada
OECD	Organisation for Economic Co-operation and Development
OL	Official Languages
PA	Program Activity
PAA	Program Activity Architecture
PDF	Post-doctoral Fellow
PPRM	Planning, Performance and Resource Management
PSSEF	Policy on Service Standards for External Fees
PWGSC	Public Works and Government Services Canada
QEII	Queen Elizabeth II Health Sciences Centre
R&D	Research and Development
RA	Research Associate
RPP	Report on Plans and Priorities
S&T	Science and Technology
SBDA	Science Based Departments and Agencies
SME	Small and Medium-sized Enterprise
SOFC	Solid Oxide Fuel Cell
STM	Scientific, Technical and Medical
TBS	Treasury Board of Canada Secretariat
TIS	Technology and Industry Support
TPC	Technology Partnerships Canada
TRIUMF	Tri-University Meson Facility
UK	United Kingdom
US	United States

Section I: Departmental Overview

Minister's Message

The Canadian economy has adapted well to the changing circumstances of the global economy. Core inflation has remained low, unemployment remains near its lowest level in more than 30 years, and the employment rate is near its highest on record as Canadian companies continue to grow and create more jobs. Canadian industries have the skilled workers, the technological know-how, the innovative capacity and the drive to compete and prosper on the world stage.

My goal as Minister of Industry, and the goal of the Government of Canada, is to ensure that Canadian businesses can continue to grow and evolve in the best possible environment — one that encourages innovation and allows Canadians to reach their full potential. That means an efficient marketplace that supports competition, attracts investment, both from within Canada and from around the world, and encourages and rewards new ideas and inventions. It means minimizing barriers to trade and labour mobility, both within the economic union and with Canada's trading partners. And it means having the infrastructure in place to support sustainable growth.

In support of these goals, the National Research Council (NRC) and the Industry Portfolio have continued to make progress over the past year on a wide range of responsibilities, including small business financing, consumer protection, the continuing health of Canada's manufacturing sectors, competition law, basic and applied sciences, and practical research. Through these efforts, the Industry Portfolio plays an important role in supporting the economic health of this country — and of all Canadians.

The Industry Portfolio is composed of Industry Canada and 10 other agencies, Crown corporations and quasi-judicial bodies. These organizations collectively play a key role in advancing Canada's industrial, scientific and economic development, and help to ensure that we remain competitive in an increasingly global marketplace.

The National Research Council's *Departmental Performance Report* for the period ending March 31, 2006, describes the achievements and results of NRC.

Members of the Industry Portfolio are:

- Business Development Bank of Canada
- Canadian Space Agency
- Canadian Tourism Commission
- Competition Tribunal
- Copyright Board of Canada
- Industry Canada
- National Research Council Canada
- Natural Sciences and Engineering Research Council of Canada
- Social Sciences and Humanities Research Council of Canada
- Standards Council of Canada
- Statistics Canada

We have accomplished much, but there is room for improvement. We will continue to work with companies and industries to make sure they are ready to capitalize on the opportunities presented

by the changing global economy, while remaining mindful of the expectation of Canadians that we be fiscally responsible and results-focused.

I am pleased to present NRC's *Departmental Performance Report* for 2005–06.

Maxime Bernier

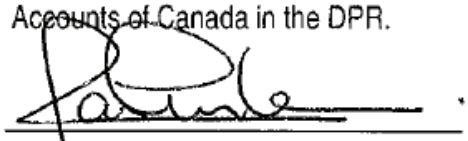
Minister of Industry

Management Representation Statement

I submit for tabling in Parliament, the 2005-2006 Departmental Performance Report for National Research Council Canada.

This document has been prepared based on the reporting principles contained in the *Guide for the Preparation of Part III of the 2005-2006 Estimates: Reports on Plans and Priorities and Departmental Performance Reports (June 2, 2006):*

- It adheres to the specific reporting requirements outlined in the TBS guidance;
- It is based on the department's approved Program Activity Architecture structure as reflected in its MRRS;
- It provides consistent, comprehensive, balanced and reliable information;
- It provides a basis of accountability for the results achieved with the resources and authorities entrusted to it; and
- It reports finances based on approved numbers from the Estimates and the Public Accounts of Canada in the DPR.

Name: 

Title: President

National Research Council's (NRC's) Business (Summary Information)

Raison d'être

NRC is the Government of Canada's leading resource for science and technology (S&T) development. NRC's primary business is:

- improving the social and economic well being of Canadians;
- technology and industry support for industrial innovation and growth; and
- excellence and leadership in research and development (R&D).

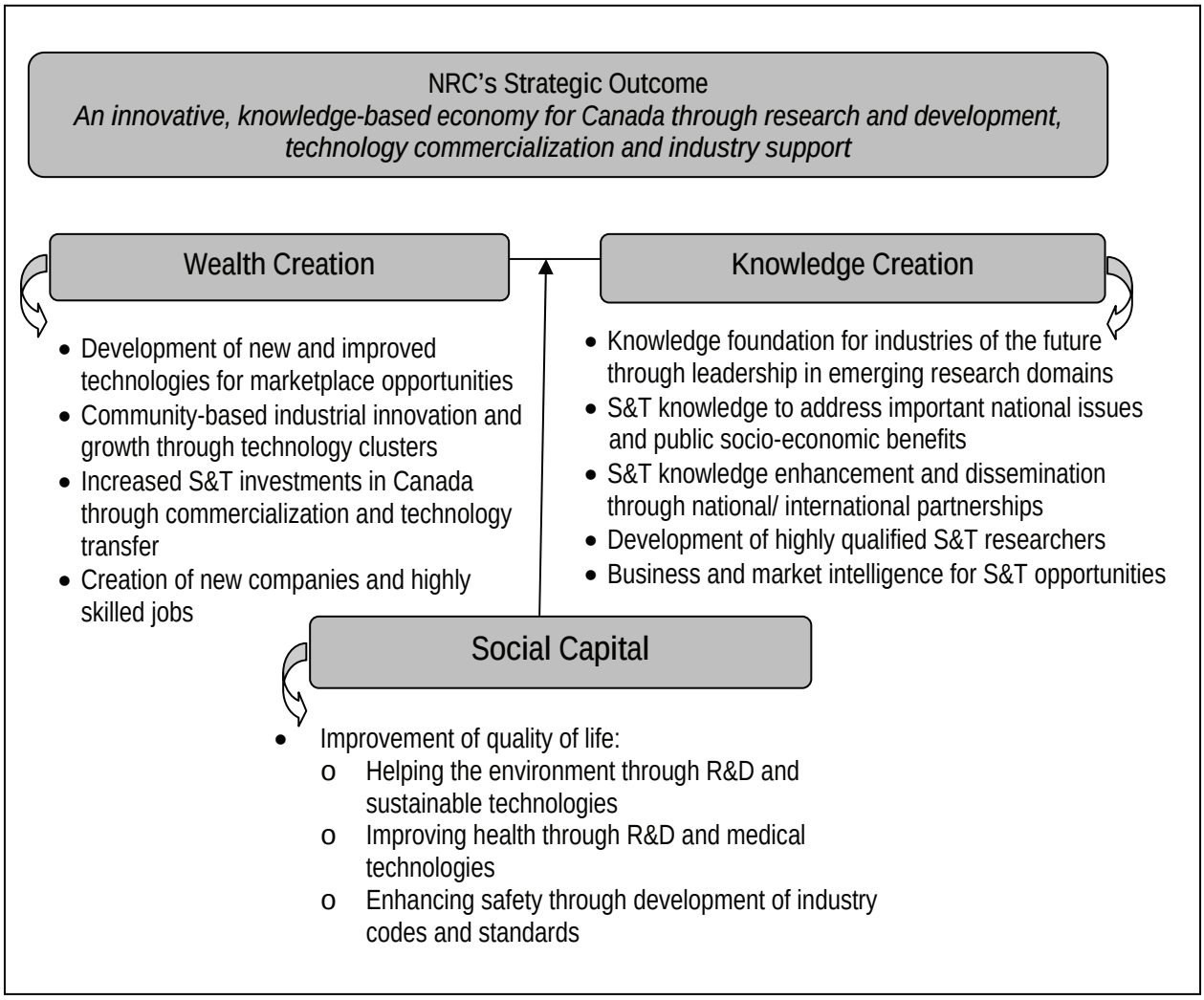
NRC Unique Attributes

- National S&T infrastructure positioned to: improve Canada's innovation capacity in existing and emerging fields of research; build networks for researchers and businesses; train highly qualified personnel; create new technology-based companies and jobs; and transfer knowledge and technology to Canadian companies;
- Creates value for Canada using its strengths: over 4,000 talented and dedicated people, 19 research Institutes, 15 industry partnership facilities (IPFs), the Industrial Research Assistance Program (NRC-IRAP) and the Canada Institute for Scientific and Technical Information (NRC-CISTI);
- The ability to help companies move from discoveries in the laboratory environment to the development and prototyping of these ideas and technologies, and the commercialization of products in the global marketplace;
- The ability to manage research towards short and long-term specific goals;

- The ability to bring together multi-disciplinary research teams to tackle issues of national importance; and
- The ability to put together national programs delivered in regions across the country.

NRC Benefits to Canadians

NRC delivers on its strategic outcome by creating wealth, knowledge and social capital for Canadians.



NRC Mandate

Under the *National Research Council Act (http://laws.justice.gc.ca/en/N-15/index.html)*, NRC is responsible for:

- undertaking, assisting or promoting scientific and industrial research in different fields of importance to Canada;
- establishing, operating, and maintaining a national science library;
- publishing and selling or otherwise distributing such scientific and technical information as the Council deems necessary;
- investigating standards and methods of measurement;
- working on the standardization and certification of scientific and technical apparatus and

instruments and materials used or usable by Canadian industry;

- operating and administering any astronomical observatories established or maintained by the Government of Canada;
- administering NRC's research and development activities, including grants and contributions used to support a number of international activities; and
- providing vital scientific and technological services to the research and industrial communities.

Table 1-1: NRC Resources for 2005-2006

Financial Resources ($ millions)		
Planned	Total Authorities	Actual Spending
$708.4	$785.8	$734.9
Human Resources (Full-Time Equivalents – FTEs)		
Planned	Actual	Difference
3,886	4,155	269

Table 1-2: NRC Business and Management Priorities for 2005-2006 – Status on Performance

Strategic Outcome: An innovative, knowledge-based economy for Canada through research and development, technology commercialization and industry support.					
Alignment to Government of Canada Outcomes: • Economic – an innovative and knowledge-based economy • International – a safe and secure world through international cooperation					
Priority	Program Activity	Expected Results identified in the 2005-2006 Report on Plans an Priorities (RPP)	Performance Status*	2005-2006	
				Planned Spending (millions of dollars)	Actual Spending (millions of dollars)
Priority #1 – Research and Development for Canada: Economy, Environment, Health, Safety (page 13)	Research and Development	• Leadership in new and emerging research domains • Excellence in R&D and innovation • Stewardship of large-scale S&T infrastructure • Contribution to federal strategies and initiatives • Research that benefits Canadians • Harmonization of international standards • New international S&T alliances	successfully met	365.36	367.10

Table 1-2: NRC Business and Management Priorities for 2005-2006 – Status on Performance (continued)

Priority	Program Activity	Expected Results identified in the 2005-2006 Report on Plans an Priorities (RPP)	Performance Status*	2005-2006	
				Planned Spending (millions of dollars)	Actual Spending (millions of dollars)
Priority #2 – Technology and Industry Support: Serving as a Catalyst for Industrial Innovation and Growth (page 29)	Technology and Industry Support	• Creation of new technology-based companies • Access to new technologies for Canadian companies through patents and licensing • Improved, broader set of commercialization metrics to provide a baseline and measure results • Enhanced innovation capacity of firms • Improved dissemination of knowledge • Supporting the Canadian industry	successfully met	191.45	186.27
Priority #3 – Enhancing Development of Sustainable Technology Clusters for Wealth Creation and Social Capital (page 35)	Research and Development Technology and Industry Support	• Competitive research and development base for cluster development • Community involvement in technology cluster – local leadership and strategies • Impacts of technology cluster activities	successfully met	80.15	68.60
Priority #4 – Program Management for a Sustainable Organization (page 44)	Research and Development** Technology and Industry Support**	• Establishment of clear corporate strategic direction • Enhanced corporate governance • Enhanced decision support • Effective research management practices • Long-term stability of financial, human and capital resources • Effective communications with NRC stakeholders	successfully met	71.45	112.89

* It should be noted that the Expected Results identified in the 2005-2006 RPP apply to a three year period and therefore not all articulated results have been successfully met in the 2005-2006 fiscal year.

** Program Activities' contributions to this priority are significantly supported by NRC's Corporate Branches which provide policy, program advice and executive support for the coordination and direction of NRC's operations and its Council. The Corporate Branches also specialize in finance, information management, human resources, administrative services and property management, and corporate services.

Operating Environment

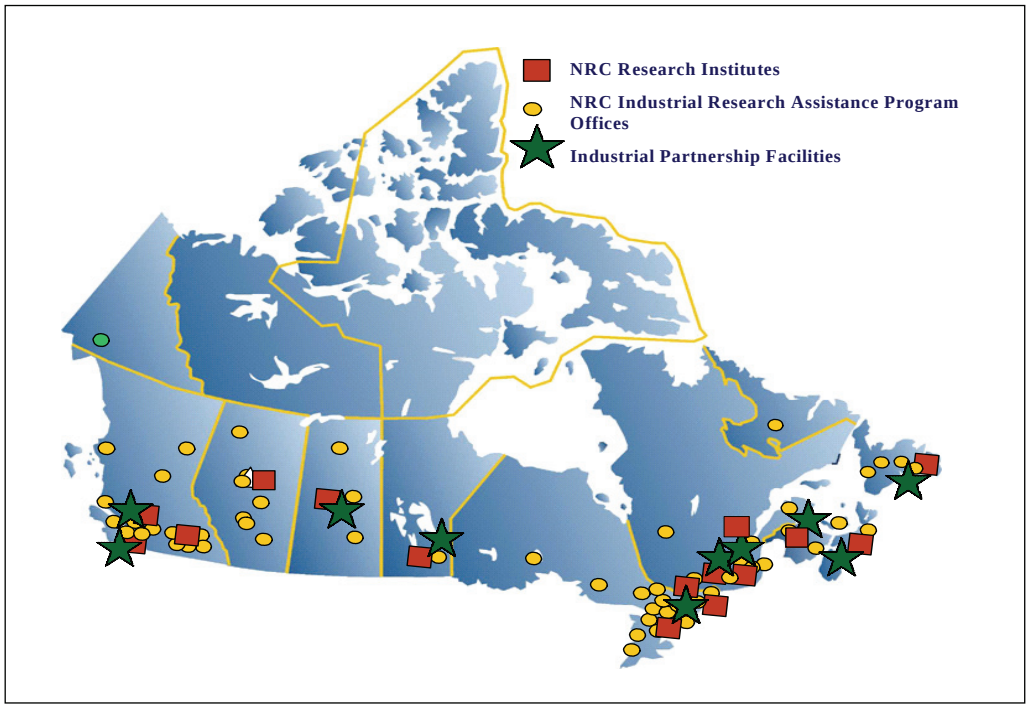
This section explains the conditions under which NRC manages itself on a day-to-day basis.

National S&T Infrastructure – NRC delivers a national S&T program with laboratories, centres and facilities in communities across Canada (See Figure 1-1). (http://www.nrc-cnrc.gc.ca/contactIBP_e.html).

Ownership, Management and Maintenance of Capital Assets – In charge of its own highly technical and complex operations, NRC manages 175 buildings totalling approximately 517,406 square metres of space.

Funding – NRC is funded through federal government appropriations. In the course of providing technical services to companies and other organizations, it recovers its costs for the purpose of reinvesting in the operation and maintenance of equipment and facilities.

Figure 1-1: NRC National S&T Infrastructure



Context

Internal Factors

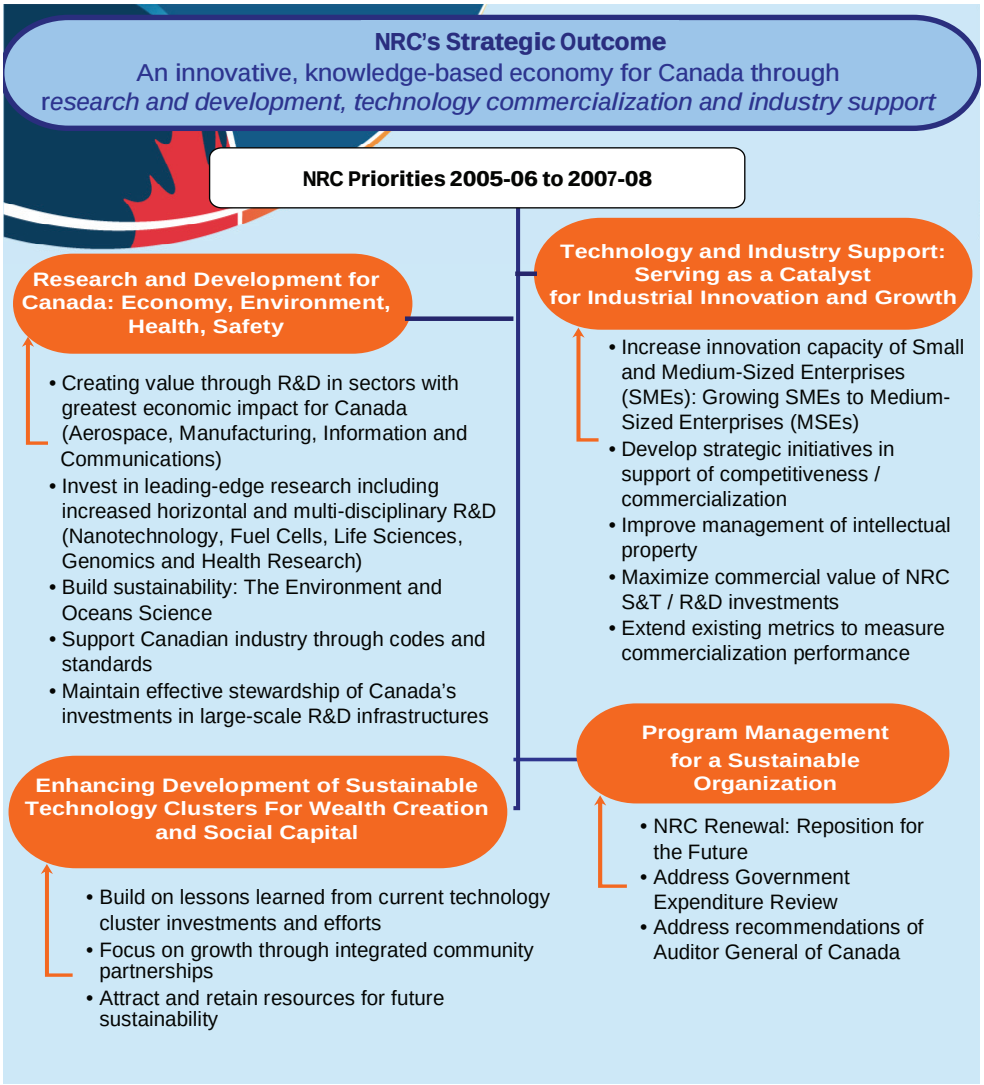
NRC Transitional Period: Building a Roadmap for Future Sustainability – The year 2005-2006 was a transitional year for the organization as it repositioned itself for the future. NRC launched its Renewal Initiative at the beginning of 2005-2006 with the aim of developing a new corporate strategy to guide the organization successfully over the next 5 to 10 years. A series of in-depth studies and consultations were completed which identified critical developments in science and technology, key trends in the global economy, and major challenges and opportunities for Canada and Canadian industry in the emerging world order. The new five-year strategy that has emerged for NRC, *Science at Work for Canada*, underlines NRC's commitment to create sustainable economic benefits and a better quality of life for all Canadians.

Reorganization – In October 2005, NRC unveiled a new organizational structure. NRC's research Institutes were divided into three portfolios, each headed by a Vice-President: Life Sciences, Physical Sciences and Engineering. The position of Vice-President, Technology and Industry Support, responsible for NRC-IRAP and NRC-CISTI, was retained and a new Vice-President, Corporate Services position was created (see organizational chart on page 50). NRC Vice-Presidents now have responsibility for the development and management of NRC's scientific assets; for integration within and between their portfolios; for people leadership and succession planning; for performance management; and for managing the financial and human resources

within their respective portfolios. These new accountabilities and structure provide a solid foundation upon which the organization operates its Institutes, Programs and Branches (I/P/Bs) - the fundamental mechanisms used to manage NRC's core capabilities.

Figure 1-2 highlights the plans and priorities identified in the 2005-2006 to 2007-2008 period (as identified in the 2005-2006 Report on Plans and Priorities (RPP)).

Figure 1-2: NRC's 2005-2006 Strategic Framework



External Factors

Economic Context – The overall economic picture in 2005 continued to demonstrate strong, favourable conditions in economic growth for Canada. Free from any major sectoral or regional losses in output or investment, the Canadian economy recorded a 2.9% increase in real gross domestic product (GDP) in 2005. The growth trend continued into 2006 with GDP growth of 0.9% in January or 3.1% annualized[1]. Employment grew 1.4% with 227,600 net new jobs created, 90% of which were full-time. The unemployment rate in Canada reached historic lows in 2005-2006,

[1] http://www40.statcan.ca/l01/cst01/gdps03a.htm, National Income and Expenditure Accounts, Statistics Canada (May 2006)

closing the year at 6.7%, down from 7.2% in 2004[2]. Continued strength in personal disposable income and low interest rates sustained activity in housing construction across the country, while consumer spending rose 4.0%[3].

Across the country, investment, trade, and financial services all contributed to an increase in economic activity. Canadian labour market conditions continued to improve in 2005. The Canadian energy products sector has been booming thanks to historically high commodity prices and increased global demand, particularly in the United States (US), China and India[4]. Venture capital investment rose 5.5% from the previous fiscal year to $1.8 billion in 2005-2006[5].

2005 was marked by a continued appreciation of the Canadian dollar against major currencies. Despite this, Canadian exports remained strong and a major source of overall economic growth[6].

Alignment with Canada's Performance – NRC has a long history of making valuable scientific discoveries that contribute to the well-being of Canadians, Canadian industry and others worldwide. NRC's efforts support two main Government of Canada priorities[7] as outlined below.

Economic – an innovative and knowledge-based economy: A better life for all Canadians is the highest priority for the federal government[8] which strives to create a higher standard of living and a greater quality of life for its citizens. Productive efforts in science and technology, education and commercialization are the cornerstones to achieving this objective. NRC supports Canada's innovative and knowledge-based economy through its focus on excellence and leadership in R&D; technology cluster growth; added value for Canada through knowledge transfer; and the development of outstanding people through education and training.

International – a safe and secure world through international cooperation: Canada seeks to play a major role in alleviating economic, health, environmental and security challenges facing the world. Through its research in genomics and health, sustainable technologies and the environment, as well as its focus on international research collaborations and assistance, NRC contributes to the development of a prosperous economy that benefits Canadians and the world.

[2] http://www.dfait-maeci.gc.ca/eet/pdf/SOT-2006-en.pdf, Seventh Annual Report on Canada's State of Trade, Trade Update (June 2006).
[3] http://www.statcan.ca/Daily/English/051223/d051223a.htm, The Daily (23 December 2005)
[4] http://www.dfait-maeci.gc.ca/eet/pdf/SOT-2006-en.pdf, Seventh Annual Report on Canada's State of Trade, Trade Update (June 2006).
[5] Canada's Venture Capital Industry in Q1 2006. Thomson Macdonald, Thomson Financial, 2006.
[6] ibid
[7] The Government of Canada priorities are taken from of the Guide to the Preparation of Part III of the 2005-06 Estimates – Report on Plans and Priorities and Departmental Performance Reports, June 2, 2006, pg. 3.
[8] http://www.fin.gc.ca/budget06/pdf/speeche.pdf, The Budget Speech (May 2006), The Honourable Jim Flaherty, Minister of Finance.

Section II: Analysis of Program Activities

This section provides an overview of NRC's Program Activities (based on the Program Activity Architecture (PAA) established in 2004) and how they contributed to the organization's four priorities (as identified in the 2005-2006 RPP) and NRC's strategic outcome: *An innovative, knowledge-based economy for Canada through research and development, technology commercialization and industry support*.

NRC's PAA is structured along two areas - Research and Development; and Technology and Industry Support. These two Programs provide a balance between conducting R&D and delivering technical and innovation support services to industry and the public.

Table 2-1: Program Activity Profiles

Program Activity	Research and Development	Technology and Industry Support
Description	Includes the research programs, technology development initiatives, and the management of national science and engineering facilities. These efforts all focus on key technological and industrial areas of Canada's economy where NRC has specific roles and recognized competencies, and where it can have an impact.	Includes the dissemination of scientific, technical and medical information, the provision of innovation assistance and engineering and technology-based facilities, contribution to the commercialization process, intellectual property management, new company creation and strategic partnerships for Canadian SMEs, NRC Institutes, the public, and other government research organizations.
Objectives	1) Achieve sustained knowledge-based economic and social growth in Canada through R&D and innovation in key areas 2) Provide efficient, client-focused services that enhance NRC's effectiveness as an integrated, S&T organization.	1) Improve the innovative capability of Canadian firms 2) Stimulate wealth creation for Canada through technological and financial assistance, information and access to other relevant resources; and 3) Provide efficient, client-focused services that enhance NRC's effectiveness as an integrated, S&T organization.
Financial Resources ($ millions)		
Planned	495.3	213.1
Total Authorities	560.4	225.4
Actual	519.1	215.8
Human Resources (FTEs)		
Planned	3,000	886
Actual	3,208	947
Difference	208	61

NRC Programs

In 2005-2006, NRC focused its efforts on programs that supported its priorities, as well as Government priorities, on optimizing its S&T investments, and expanding its value and reach. These programs are horizontal, multi-disciplinary and cross-organizational and encompass a number of NRC entities (e.g., research Institutes, laboratories, centres, facilities, programs and services). The performance of the following are provided throughout this report:

- The Genomics and Health Initiative (NRC-GHI) – see page 22
- The Fuel Cell and Hydrogen Program (NRC-FCHP) – see page 24
- The Industrial Research Assistance Program (NRC-IRAP) – see page 30
- The Canada Institute for Scientific and Technical Information (NRC-CISTI) – see page 31

NRC's Overall Performance for 2005-2006

Priority 1 Research and Development for Canada: The Economy, the Environment, Health and Safety

In 2005-2006, the Research and Development program activity contributed to the priority of R&D for Canada through its core strengths – national research institutes and innovation dedicated to technology fields important to Canada; value creation through knowledge and technology transfer; the pursuit of leading-edge and integrated research in emerging cross-disciplinary fields; and the creation of economic and social benefits for Canadians. Continued support of Canadian industry through codes and standards and access to national facilities, and of the research community through stewardship of Canada's "big science" facilities remained an underlying foundation to global marketplace access and international R&D alliances. The program activity also continued to develop new technologies leading to commercialization opportunities for Canadian industry.

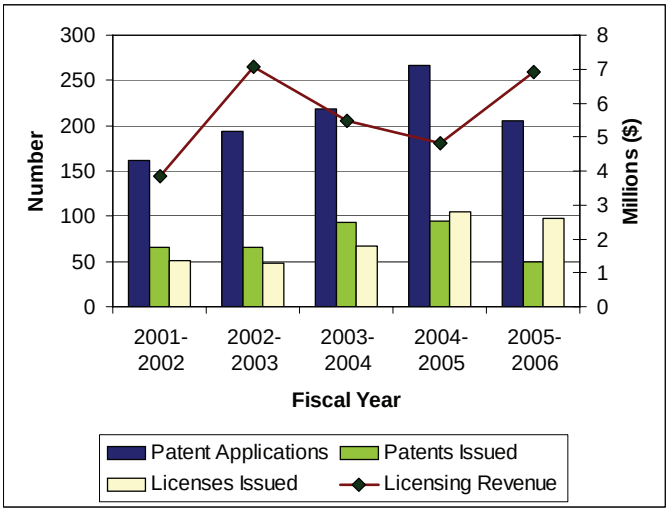
Performance Indicators (as identified in the 2005-2006 RPP)	• Technology transfer (patents, licences) • Spin offs/ ins • Publications in refereed journals / proceedings and technical reports • Citations comparison • External grants • Leadership and contribution to Federal horizontal initiatives • Multi-researcher networks and centres of excellence • Number and value of international collaborative agreements

Not all performance indicators are reported on annually.

A new patent is a key step in the continuum from discovery to innovation. The strategic management of intellectual property (IP) makes a contribution to the innovative capacity of firms. In 2005-2006, NRC applied for 206 new patents and secured 49 patents from applications made in previous years. Thirty-seven percent of these were issued in the US – an Organization for Economic Cooperation and Development (OECD) recognized measure of competitiveness. The number of patent applications decreased as a result of the implementation of a more strategic approach to patent decision-making. Based on a 2003 benchmarking study of best practices in IP management, NRC is changing its approach by screening disclosures early; extending screening to patenting decisions; conducting market research and patent analysis assessments; and regularly reviewing its IP portfolio to generate, identify and develop more "high potential commercial value" IP.

By negotiating a licence agreement to use NRC technology, the industrial partner endorses the merit of NRC research and these agreements show a direct flow of innovation into business application. NRC entered into 97 new licence agreements in 2005-2006 (a similar number to last year) and IP licensing revenue was $6.9 million (see Figure 2-1).

Figure 2-1: NRC IP Portfolio (2001-2006)



Just over $3.8 million of IP revenue in 2005-2006 was attributed directly to the Menigities-C vaccine and one million dollars to hardware and software development attributed to the NRC Institute for Information Technology (NRC-IIT).

Some examples of NRC technology licensed to industry in 2005-2006 include:

- The NRC Industrial Materials Institute (NRC-IMI) successfully transferred a number of technologies for plastic, composite and metal-powder based products. These included modeling software to PACE Simulation; unique composites technologies to Groupe Synergy Composites for truck parts; and to Les Canots Esquifs for a new manufacturing process for canoes.

- The NRC Centre for Surface Transportation Technology (NRC-CSTT) developed a new elastomeric pad that improves the performance of railcar bogies (the chassis or framework carrying the wheels). This has been licensed to ASF, the largest North American bogie manufacturer.

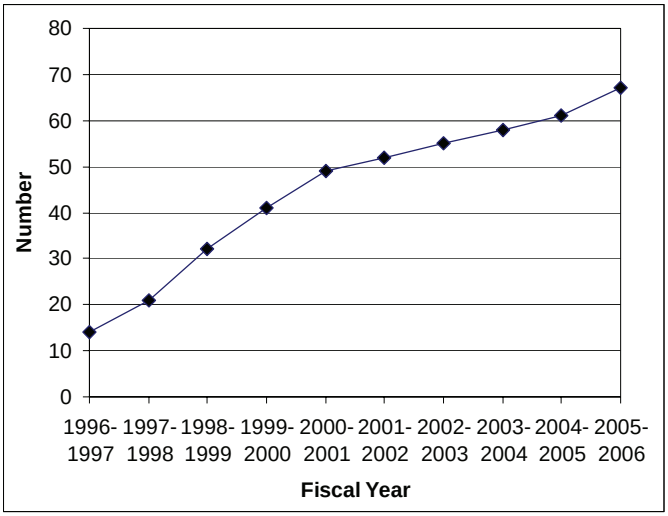
- As its contribution to an international astronomy facility, the Atacama Large Millimetre Array (ALMA) – expected to be completed in 2011, the NRC Herzberg Institute of Astrophysics (NRC-HIA) has been developing a new generation of extremely sensitive Band 3 receivers. Having developed special cryogenic amplifiers for these instruments, NRC-HIA identified a Canadian company, Nanowave Technologies Inc. that was capable of producing these amplifiers to the exacting standard required. The company has licensed the technology and will be further developing it to expand its potential into its own product lines.

- The NRC Institute for Biological Sciences (NRC-IBS) licensed its patented archaeosome adjuvant technology to Nicholas Piramal India Ltd. (NPIL). This technology has been demonstrated to provoke both arms of the immune system, systemic and cell mediated immunity, therefore having efficacy in vaccine applications against both intracellular and extracellular pathogens and cancer.

- NRC-IBS ground breaking work on single-domain antibody techniques and phage display libraries led to licensing agreements with two Canadian companies, Helix Biopharma Corp. and Protox Therapeutics Inc., to develop antibody-based cancer therapies.

- The NRC Institute for Biodiagnostics (NRC-IBD) has officially entered into a licence agreement with Vioptix Canada Inc. that will allow the company and its US parent to commercialize NRC-IBD's Tissue Viability technology. More specifically, based on the corresponding US patent, Vioptix Canada now has the exclusive rights to the non-invasive cutaneous measurement of tissue oxygenation and/or total haemoglobin indices using Point Spectroscopy - excluding cases where the study performed is specifically to assess a burn injury. Vioptix recently was granted Food and Drug Administration (FDA) approval in the US for their existing product, which is complementary to the NRC technology. The close fit between the two technologies should translate into a significantly reduced development time. Both parties view the licence as the beginning of a long partnership on development projects.

Figure 2-2: NRC New Ventures – cumulative (1996-2005)



When NRC develops a technology with particularly strong market potential and there is no Canadian receptor capacity identified, entirely new companies are created to commercialize the technology. These new companies create innovative products and services for the global marketplace and new jobs for Canadians. In 2005-2006, NRC launched six new companies bringing the total of new companies created since 1995 to 67, accounting for approximately 700 full-time jobs and an estimated $462 million in cumulative investment, an increased of 20% from last year[9] (see Figure 2-2). In 2005, investment from all sources into NRC new companies was up significantly to $123 million, over two times the level of 2004 ($57 million).

Companies created in 2005-2006:

- *Virtual Marine Technology (VMT)* – A spin-off from the NRC Institute for Ocean Technology (NRC-IOT), this platform technology provider specializes in marine-based simulation solutions. With a mandate of improving the safety of life at sea, VMT (http://www.virtualmarinetechnology.com/) works in conjunction with NRC and Memorial University's Ocean Engineering Research Centre using NRC-IOT's facilities to conduct training and model testing of evacuation systems during severe weather storms.

- *Qbiotyx Ltd.* – In response to an increase in market demands for customized antibodies, NRC-IBS scientists developed a unique, innovative pentabody technology, which, for example, can provide antibodies against cells from cancer tumours. NRC researchers teamed with a United Kingdom (UK) clinical lab researcher to form Qbiotyx Ltd. which aims to meet the demand for obtaining rapid, reliable, well-characterized antibodies for the diagnostic and life sciences markets.

[9] Adventus Research Inc., *Economic Impact of National Research Council Canada Spin-Off Companies 2006 Survey*, February 28, 2006.

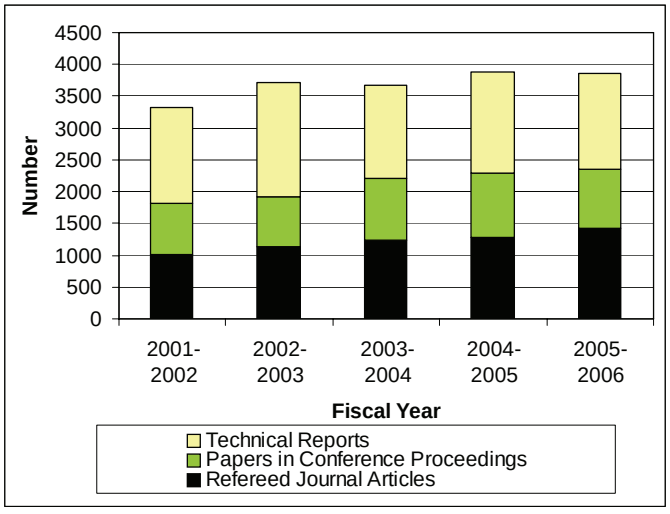
- *MAGI Control Inc.* – NRC-IMI and McGill University are currently close to completing a research program on the development of control systems for plastics forming operations. The program has resulted in the training of over 10 graduate level students (Masters and PhD) in this field. As a result of the partnership, an automatic controller was developed, specifically for thermoforming that results in a 20% reduction in energy costs and a 50% reduction in material wastes. The technology is currently being commercialized, by one of the former students in the program, who has started MAGI Control. MAGI Control is presently installing its first industrial set-up at a Quebec-area company.

- *Methusula Microcell* – This company licenses technology developed at the NRC Institute for Fuel Cell Innovation (NRC-IFCI). The technology relates to a method of fabricating micro fuel cells and membrane electrode assemblies by thin film deposition techniques using a dimensionally stable proton exchange membrane as a substrate. The application also relates to membrane electrode assemblies and fuel cells fabricated in accordance with the method. The method minimizes materials and production costs and is particularly suitable for low power battery replacement applications.

- *AgaPharm* – Eighty percent of all diabetics will become blind due to this disease, which is the leading cause of blindness in North America. The AgaPharm team, including a researcher with the NRC Biotechnology Research Institute (NRC-BRI), have developed a safe, low-cost prescription eye-drop that has the potential to replace the high cost, high risk surgery that is currently the only treatment option.

- *Saponin Inc.* – This company, located in Saskatoon, was created to commercialize the many useful chemicals derived from the plant Saponaria vaccaria, also known as cow cockle. The research to characterize Saponaria's chemical constituents and the work to make a proper breeding line took place at the NRC Plant Biotechnology Institute (NRC-PBI).

Figure 2-3: NRC Publications (2001-2006)

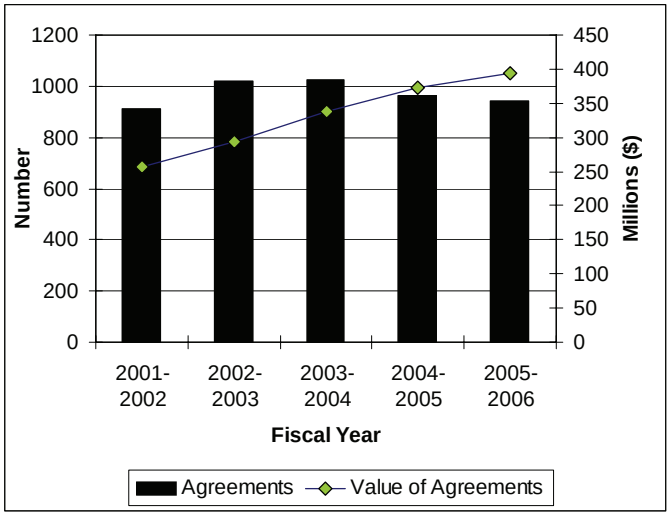


Scientific papers in leading peer-reviewed publications and conference proceedings are internationally acknowledged measures of research quality and relevance. They are also a key tool for the dissemination of knowledge and the eventual creation of value for Canada in the long-term. NRC has consistently produced over a thousand peer-reviewed publications each year over the last five years. In 2005-2006, researchers published 1,430 articles in refereed journals (a 10% increase over last year) including two research articles in the highly ranked journal *Nature*. NRC researchers also presented 924 papers at S&T conferences and produced 1,515 technical reports for clients (see Figure 2-3).

NRC's research excellence is also evident in the involvement of its researchers in multi-researcher networks and centres of excellence as well as the number of externally funded research grant proposals. In 2005-2006, NRC researchers participated in 114 research networks, held 178 positions on editorial boards of scientific journals and were appointed to 441 adjunction professorships in Canadian universities (7% increase over last year). Two hundred and sixteen research grants provided NRC researchers and their partners with $26 million, over the lifetime of the projects (similar to 2003-2004 levels). Examples of external awards received by NRC researchers in the last year can be found in Appendix A.

National leadership in R&D and innovation is demonstrated by the participation of NRC researchers on 627 national committees (15% increase over last year) and by the 273 conferences and workshops organized by the Institutes.

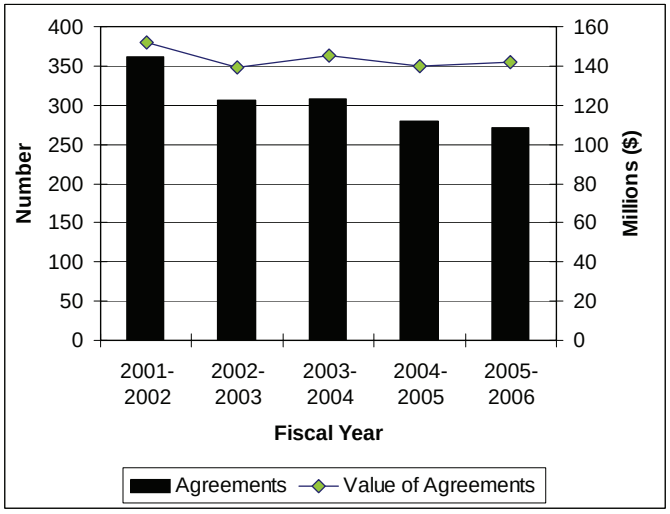
Figure 2-4: Canadian Collaborations (2001-2006)



In 2005-2006, NRC signed 393 new formal collaborative research agreements with Canadian partners worth a total of $78 million. Although the total number of active collaborative agreements during the fiscal year fell slightly to 941, the total value over the lifetime of these agreements grew to $394 million (see Figure 2-4). This is a 6% increase over last year's value. The number and value of collaborative agreements are indicators that foretell increased research activity. NRC's Canadian partners invest 1.57 dollars for every dollar NRC invests.

In 2005-2006, NRC signed 95 new formal collaborative research agreements with international partners worth $33 million. The total number of active international collaborative agreements is similar to last year's number (see Figure 2-5), with a total value over the lifetime of the agreements of $141.6 million. NRC's international partners invest 3.54 dollars for every dollar NRC invests.

Figure 2-5: International Collaborations (2001-2006)



Create value through R&D in sectors with the greatest economic impact for Canada

Facilitate transition to next generation aerospace – Newly hired staff that had been housed in temporary rented accommodation in the Montreal area moved into the new Aerospace Manufacturing Technology Centre (NRC-AMTC) in May 2004. Over the past year, staff have been commissioning the building, retrieving and re-commissioning major equipment that had been temporarily located in partner premises and establishing research programs and relationships with the aerospace manufacturing community in Montreal and throughout Canada. A total of nine partnerships were established in 2005-2006 with another three under negotiation with both industry (Original Equipment Manufacturers and SMEs) and universities (Consortium for Research and Innovation in Aerospace in Quebec - CRIAQ) in NRC-AMTC's four targeted technology areas – Automation and Robotics; Metallic Products; Composite Products; and Material Removal.

Projects implemented in 2005-2006 at the Gas Turbine Environmental Research Centre (NRC-GTERC) were equally divided between fee-for-service support to Pratt and Whitney Canada (PWC) and collaborative research on industrial gas turbine combustion processes and components for Rolls Royce Canada. These projects generated approximately $4M in total revenue and income. The NRC Institute for Aerospace Research (NRC-IAR) was awarded the largest external collaborative research project by PWC since 1995, as well as a second environmentally targeted multi-partner collaborative research project headed by PWC. All collaborative combustion research supports product development that meets environmental regulations.

Position Canadian industry as a key player in advanced manufacturing – The Integrated Manufacturing Technologies Institute (NRC-IMTI) in London, Ontario develops next generation manufacturing solutions and integrated systems for the competitiveness of Canadian industry. The Institute is currently collaborating with over 105 clients. Sixteen new processes and products were developed in precision and freeform fabrication, and virtual and reconfigurable manufacturing technologies. NRC-IMI develops next generation materials technologies to respond to Canadian competitiveness; health and security; environment; and energy. NRC-IMI is currently collaborating with 240 partners on the national and international scene.

The NRC Institute for Chemical Process and Environmental Technology (NRC-ICPET) in Ottawa, Ontario targets solutions for Canada's chemistry intensive industries. With a core competency in multiphase reactive systems, NRC-ICPET is focusing on technology application areas (fuel cells, oil sands and bioproducts) that bring innovative solutions to Canadian industry as well as improving environmental performance. NRC-ICPET participates in key networks related to its priority areas of research. One is the Ottawa-based Bioproducts Business Network (BBN), an important new driver of economic development in eastern Ontario, aimed at developing new commercial relationships among bio-sector stakeholders. The Institute organized a recent workshop that attracted over 50 of the region's most influential bioproduct stakeholders from industry, academia and government. The workshop assisted the Institute to align its research priorities with industry needs in the development and application of bioproducts and sustainable technologies to support a bio-based economy. NRC-ICPET also participated in the Canadian Oil Sands Network for Research and Development (CONRAD), an organization including 15 industry members that collaborates on R&D solutions to improve innovation and sustainability in oil sands extraction. NRC-ICPET is currently developing closer ties with the Kingston-based Fuel Cell Research Centre,

working with Queens University and Royal Military College to facilitate collaborations with firms such as DuPont, Hydrogenics and Fuel Cell Technologies to bring new hydrogen-based technologies to market.

Reduce industry risks and costs of working on next generation information and communications technology – NRC-IIT in Ottawa, Ontario and Fredericton, New Brunswick develops information technology (IT) solutions linked to extracting knowledge from data, making systems people-oriented and making IT accessible through e-Business. Ongoing work includes the establishment of measurement standards for 3D imaging in collaboration with the NRC Institute for National Measurement Standards (NRC-INMS); the development of innovative search engines; and intelligent systems for diagnostic applications in health.

NRC-IIT researchers are involved in developing software to improve the info-mining of a particularly challenging area: scientific literature. The software, Litminer, presently in development, will help genomics and proteomics researchers to more effectively comb through the tens of thousands of scholarly articles published each month and find the latest discoveries and technical advances most useful to them. This year, a second, more advanced version of the software was introduced, allowing high-throughput searching in a table.

NRC's Institute for Microstructural Sciences (NRC-IMS) participates in horizontal programs focused on quantum information, including the Canadian Institute for Advanced Research Network on Nanoelectronics, the Natural Sciences and Engineering Research Council (NSERC) funded Networks of Centres of Excellence (NCE) Quantum Works, and the Defense Advanced Research Projects Agency (DARPA) Quantum Information Science and Technology (QuIST) program, working with collaborators to develop the computing systems of the future.

This year, after being the first to demonstrate that a single electron or spin could be isolated by purely electrostatic means in a quantum dot, NRC-IMS researchers created the first electron triple dot. This has been recognized by the scientific community as a significant step forward to a useable semiconductor-based qubits, the operational unit of a quantum computer. The Institute's competencies in the growth of epitaxial materials and fabrication of nanostructures enabled another breakthrough with more immediate application, that of lasers and detectors that are promising in the range where environmental pollutants can be detected.

Invest in leading-edge research including increased horizontal and multi-disciplinary R&D

Increase synergies in biomanufacturing and bioprocessing – NRC-BRI and Laborium ™ Biopharma Inc. maintained their collaboration in biomanufacturing until December 2005, when the company successfully closed its European financing to build its new current Good Manufacturing Practice (cGMP) facility in Canada. However, this project is on hold as investigators await the outcome of the ownership of the former DSM Biologics facility on the NRC-BRI campus to validate compatibility or competition with the company. The plan is that the Laborium project would be integrated within the existing DSM Biologics facility as a co-business unit.

In 2005-2006, NRC-BRI completed the detailed description of a new biomanufacturing program with McGill University and John Abbott College. The University is currently reviewing its certificate degree and will make use of some part of the program at the Master level.

Support health for Canadians: Vaccines, immunology and neurodegenerative diseases – As part of a collaboration with a leading multinational vaccine company and Oxford University, proof of principle was obtained for a lipopolysacharide (LPS)-based vaccine strategy against Group B meningitis, a major cause of morbidity and mortality in the developed world and where there is currently no approved vaccines. The LPS-based platform could lead to a second generation vaccine to protect Canadian infants against all groups of this deadly pathogen.

NRC-IBS researchers attracted significant funding ($1 million US this year) from the US National Institute of Health (NIH) to develop a vaccine as part of international consortium on biosecurity. The NRC-IBS team is recognized internationally as a research leader in tularemia, a deadly respiratory infection. The vaccine will be developed by the US based DynPort Vaccine Company.

In collaboration with Dow Agrosciences Canada Limited (DASC), NRC-IBS researchers are searching for novel alternatives to antibiotics to reduce the risk of food related disease caused by pathogenic organisms. Antibiotic resistance threatens our ability to control bacterial infections. NRC's research is focused on *Campylobacter jejuni*, the leading bacterial cause of food-borne disease in North America. Last year the team obtained proof of principle for an antibody based decolonization strategy to reduce the bacterial load in animals. This was a significant achievement towards the development of a new generation of feed-based products that will be developed by the industrial partner. The team is also exploiting the exquisite specificity of unique bacteriophage binding proteins in the fight against environmental pathogens. Bacteriophage are viruses that attack and kill bacteria.

NRC-IBS scientists have established a network of collaborators within NRC (NRC-IBD, NRC-BRI, NRC-IMI, the NRC Steacie Institute for Molecular Sciences (NRC-SIMS)), with Canadian (University of Calgary) and international (NSC-Taiwan, ITRI) institutions and with industrial partners (ART, GE Healthcare) and obtained funding (a $75K Canadian Institutes of Health Research (CIHR) team grant; $150K from the NRC-Taiwan Initiative) to develop a new generation of optical and magnetic resonance imaging (MRI) molecular imaging agents for diagnostic imaging of brain diseases, including stroke and brain tumors.

NRC-IBS scientists have pioneered the development of a 'neuro-chip', a complex interface of living neurons or brain tissue with multi-electrode arrays with utility in drug screening and diagnostic testing. In collaboration with a local company, QBM, University of Ottawa and partners in Germany, NRC-IBS is participating in creating a Neurochip Consortium as a vehicle for future development and commercialization of this technology.

The NRC Institute for Marine Biosciences (NRC-IMB) in Halifax assisted the Canada Food Inspection Agency (CFIA) in a survey of Canadian shellfish for the presence of emerging new toxins of concern that have appeared in other countries. In the last year NRC-IMB scientists have confirmed for the first time in Canada the presence of two toxin classes, yessotoxins and azaspiracids. This allowed increased surveillance to be implemented to ensure that contaminated shellfish is not released to the public.

Plant Hormone Profiling Technology was developed by NRC-PBI researchers to measure multiple plant hormones in plant tissue samples. It has proven to be an excellent research tool for elucidation of the role of the signaling molecules in plant metabolism. NRC-PBI is working with numerous collaborators to develop this technology for a broad spectrum of crops and tissue types.

NRC-PBI and Pioneer Hi-Bred will develop this technology for the US regulatory requirements so as to be able to demonstrate essential equivalency in GMO crops.

Integrate nanotechnology research and innovation – Through 2005-2006, NRC's Institute for Research in Construction (NRC-IRC) continued its foundational work exploring new technologies and products for the building industry based on nanotechnology, concentrating on cements, cement-based products and concretes. The addition of nanoscale particles to concrete has shown promise in improving the control of concrete microstructure beyond what is possible with existing technologies. Programming the time-release of chemical admixtures will also provide maximum effectiveness at the construction site, while reinforcing cement binders with carbon nanotubes may produce tougher cement-based products by impeding crack formation. The goal is the development of superior quality materials, leading to more sustainable structures that can better endure severe weather changes and natural disasters.

Breakthrough research, published as a cover story for *Nature Chemical Biology*, gave NRC scientists at NRC-SIMS, a front row seat to watch heart cells in action. For the first time ever, scientists can now visualize and quantify the nanoscale receptor clusters in heart cells. Using a specialized optical microscopy technique, scientists reveal how receptors on the heart muscle cells respond to hormonal signals from their environment. Essentially, the new imaging technique improves researchers' understanding of how these receptors, the primary transducers of the 'fight or flight' response, accelerate the heart rate. This understanding could ultimately lead to the development of novel therapeutics for regulating heart arrhythmias.

NRC-IMI has advanced significantly in putting in place its nanoimprint platform and strategy, in particular by finalizing the implementation of its Nanoimprint Lithography Prototyping Facility. Construction of the physical facilities is well advanced and several pieces of equipment are on hand. NRC-IMI is finalizing design and performance specifications for some key fabrication equipment, scheduled for construction and delivery in 2006-2007. The operations of the prototyping center are being implemented. A strategic partnership with the Canadian Nano Business Alliance (CNBA) has been put in place to develop the network and commercial interface in order to support companies in commercializing innovative products. See http://www.nrc-cnrc.gc.ca/highlights/2005/0508nanoimprint_e.html.

Support National Security – Chemical Biological Radiological Nuclear (CBRN) Research Technology Initiative – NRC continued to participate in a CBRN Research and Technology Initiative (CRTI) project to develop sensors for the rapid detection and identification of pathogens. NRC-IMI leads in this initiative in collaboration with NRC-SIMS, Health Canada, Defence Research and Development Canada (DRDC) in Suffield and Laval University. A first phase of the project has been completed by NRC-SIMS, with additional work currently being carried out at NRC-IMI and Laval University. The project will be completed in 2007.

Program Spotlights

Address key social and economic challenges through integrated Genomics and Health Research

Genomics and Health Initiative (NRC-GHI)

Description: NRC conducts over half of all biotechnology research performed by the federal government and is a major player in the Canadian Biotechnology Strategy, contributing to important advances in genomics, proteomics, and health research through NRC's Genomics and Health Initiative (NRC-GHI). The NRC-GHI was established in 1999 to strengthen NRC's capabilities in genome and health science, integrate research capabilities across NRC, and contribute to national genomics and health research efforts in collaboration with other federal agencies, industries and universities. NRC-GHI currently comprises eight research programs, supported by three technology platforms (DNA MicroArray, DNA Sequencing, and Proteomics). NRC-GHI is NRC's largest horizontal research initiative.

Plans from the 2005-2006 NRC RPP: In 2005-2006, NRC-GHI entered its third phase of research activity and continued to integrate research and technology disciplines across NRC Institutes in order to drive commercially relevant advances in cutting edge areas of genome and health-sciences. The initiative focuses its efforts in six new programs oriented towards diagnosing, treating and preventing human and animal disease; developing technologies for pathogen detection; and advancing new technologies for cardiac care and the production of commercially valuable agricultural crops.

Recognized Program Management Process: NRC is committed to effective research program management practices[10] and has integrated lessons learned from the first two phases of NRC-GHI to refine the competitive program selection process for the third phase. In NRC-GHI Phase III an external Expert Panel that included industry representation reviewed all program proposals for quality and relevance. NRC uses selection criteria that favour integration of research capabilities across NRC Institutes, collaboration with external partners in other government departments, academia, and industry, as well as commercial potential. NRC has also Instituted formal program management for all NRC-GHI programs, tracking progress against explicit milestones and deliverables. Performance is being evaluated quarterly in the third phase of NRC-GHI.

Financial Resources

Planned*	Total Authorities*	Actual*
$11 million	$11.2 million	$10.8 million

* $6 million of annual funding is subject to Treasury Board renewal. Current TB approval covers the period of April 2006 to March 2008.

Additional Investments: Since 2002, NRC Institutes contributed matching funds of between $13-14 million per year to GHI funded projects. Institutes will continue investing at these levels and thereby ensuring an mechanism for ensuring integration amongst NRC biotechnology research programs.

Planned Results: NRC-GHI has four primary goals that it aims to achieve through its cross-disciplinary research:

- To create a knowledge base in genomics that will contribute to Canada's competitiveness in the 21st Century.
- To create and use new genomics or health-related technologies to support Canadian industrial sectors such as aquaculture, agriculture, environment, and health.
- To support and participate in the development of sectoral, national, and international genomics and health-related innovation networks.
- To foster increased cooperation and integration in genomics and health-related research and innovation programs across NRC and with public and private sector partners.

[10] GHI's program selection process was recognized as being an example of a good priority-setting framework at NRC by the OAG's March 2004 Report.

In addition to these goals, NRC-GHI aims to maintain excellence in horizontal research program management and accountability.

In conjunction with NRC-GHI goals, each research program has also identified key objectives and milestones to fulfill over the three-year research period of Phase III.

2005-2006 Performance:

Stewardship

Scientific Output: The six NRC-GHI programs produced the following research outcomes over the past year:

- 100 papers in refereed journals and peer reviewed conference proceedings
- 61 invited external presentations at conferences and symposiums

Examples of impacts from selected NRC-GHI research programs include:

- Genomic Approaches to Aquatic Animal Disease Management - The assembly of the genome sequence of the pathogen *Aeromonas salmonicida* subsp. *salmonicida*, strain A449 was completed as planned, and the program's first live attenuated vaccine candidates were tested. Three candidates showed significant protection during trials. Discussions are underway with potential industrial partners, interested in bringing these vaccines to market. Program milestones, planned for year 2 have already been met in year 1.

- Managing Chronic Cardiovascular Disease - A Siemens 3T (3-tesla) whole-body MRI system was installed and is expected to be fully operational in year 2. This system will provide ultra high-field strength and clarity revealing changes in body structures and physiological processes that other tests may not find – making it a valuable tool in the early detection and treatment of cardiovascular disease.

Integration: NRC-GHI has seen a notable increase in research integration with the introduction of new Phase III programs. While there are fewer research programs, the degree of collaboration and number of participating Institutes has grown. Ten NRC Institutes are participating in GHI III, three of which are new – NRC-IMS, the National Institute for Nanotechnology (NINT) and NRC-IMI.

Economic Benefits

Patents and Licenses (FY 2005-2006):

- 9 patent applications
- 4 licenses
- The *Personalized Medicine for Cancer* program received approximately $17,000 license revenue from Protox in Victoria and Helix Biopharma in Toronto.

Material Transfers Agreements (MTAs):

1. 9 MTAs were signed, the majority being part of the *Genomic Approaches to Aquatic Animal Disease Management* program.

Citizenship Engagement

In 2005-2006, NRC-GHI improved its degree of citizen engagement and interaction. In March 2006, NRC-GHI showcased its research to a group of 30 visiting high school science students as part of the NRC Partners in Education Program. Students visited NRC research facilities to learn about the technologies and benefits of integrated research in genomics and the life sciences. The visit involved presentations from several NRC-GHI researchers and culminated with an interactive lunch with the researchers as well as a science quiz and award ceremony.

In addition, several NRC researchers have been involved in activities such as lab tours for students, industry

and government, as well as participating in other educational events such as the Aventis Biotech Challenge.

NRC Research Institutes involved:
2004-2005
NRC-BRI, NRC-IIT, NRC-IBD, NRC-IMB, NRC-IBS, NRC-PBI, NRC-SIMS, NRC-IMTI
2005-2006
NRC-BRI, NRC-IIT, NRC-IBD, NRC-IMB, NRC-IBS, NRC-PBI, NRC-SIMS, NRC-IMI, NRC-NINT, NRC-IMS

Website: http://ghi-igs.nrc-cnrc.gc.ca/home_e.html

Support Canada's Leadership in Fuel Cells

Fuel Cell and Hydrogen Program (NRC-FCHP)

Description: In October 2003, the Federal Ministers of Industry and Natural Resources announced funding in support of the Hydrogen Economy and to stimulate hydrogen R&D and demonstration projects. A total of $7 million over five years has been allocated to NRC for its Fuel Cell and Hydrogen Program (NRC-FCHP) – a key NRC horizontal initiative. The NRC-FCHP mobilizes fuel cell expertise and research strengths from a network of NRC research Institutes across Canada.

Plans from the 2005-2006 NRC RPP: In 2004-2005, 11 projects at six NRC Institutes were approved and will be the focus of research during the planning period. Each participating Institute will work with regional R&D providers, universities, government agencies and local industry to support the development of regional fuel cell clusters. By linking these Institutes through a coordinated national program, NRC will help build a strong Canadian fuel cell industry.

The Institute for Fuel Cell Innovation (NRC-IFCI): In the upcoming years, NRC-IFCI will engage in research on next generation Polymer Electrolyte Membrane (PEM) Fuel Cells and Solid Oxide Fuel Cells (SOFCs) aimed at reducing costs and improving reliability and durability, the provision of a Technology Centre and an Incubation / Acceleration and Networking Facility for integrated technology demonstrations, and industry-university-government partnerships. NRC-ICPET's fuel cell-related projects will focus on polymeric materials of fuel cell applications, virtual engineering of fuel cells, advanced materials research for an intermediate temperature SOFC; and electrocatalysis.

NRC has committed to reallocating $15 million of existing resources towards hydrogen research over five years (2004-2009) as a matching contribution to the Government's support of the Hydrogen Economy.

Financial Resources

Planned*	Total Authorities	Actual
$1.405 million	$1.405 million	$1.405 million

* the 2005-2006 RPP incorrectly included A-base allocations to this program, inflating planned resources to $4.9 million.

Planned Results: The NRC-FCHP will facilitate the transition to the hydrogen economy and foster a globally competitive industry in Canada. Correspondingly, the program objectives are to:

- Catalyze the outstanding expertise of NRC researchers in a range of disciplines to gain fundamental understanding of materials and processes that will lead to the commercialization of technologies that meet the industry's next generation targets for performance, durability and cost.
- Maximize impact by organizing research along themes developed in partnership with the NRC research community, external experts and the Canadian fuel cell and hydrogen industry, and enabling inter-Institute efforts to bring the best teams together.

2005-2006 Performance

Risks that affected performance of the Fuel Cell and Hydrogen Program - In April 2006 funding cuts of about 30% were made to all existing federal climate change programs for the period April 2006 until March 2008. NRC's allocation was correspondingly reduced from $2.83 M to $2.0 M over the final two years, for a revised five year total of $6.17M.

Immediate Outcome:
Based on the quality of the research work, collaborative projects directly resulting from program projects have been established with two Canadian companies, as well as an international automotive company. NRC was invited to work with European Union partners on an SOFC project, and Japan's New Energy and Industrial Technology Development Organization (NEDO) provided funding to support SOFC research at NRC-IFCI.

1. Nanocrystalline ceramic powders
NRC-IFCI received a cash contribution of $250K from the Japanese government "New Energy Development Organization (NEDO)" in 2005 towards one of its research projects. The objective of the project is to develop nanocrystalline ceramic powers as proton conducting materials through the reactive stray deposition technology. The core competency that has been built up through this project is being further developed at NRC-IFCI and has found important applications in PEM fuel cells.

2. Mass transport and electrochemical activity
Recently NRC-IFCI signed a research agreement with Japanese Nissan Motors Ltd. This project is to develop fundamental understanding of the complex interplay between mass transport and electrochemical activity inside a PEM fuel cell's catalyst layers and to develop underlying concepts enabling the development of nano-structured catalyst layers. This one year project includes a cash contribution by Nissan Motors Ltd. of $650K. The fundamental understanding that will be achieved in this project will benefit the entire fuel cell community.

3. Novel polymers for PEM membranes
At the microscale separation of block copolymers can be used to create well defined periodic domains of controlled morphology on the nanoscale, critical to the production of semi-permeable membranes. Research supported by the program at NRC-ICPET has resulted in the synthesis of a novel series of highly fluorinated comb-shaped copolymers that can be used as proton exchange membranes. The polymers create a defined microstructure, crucial to good performance in the fuel cell. Initial test results indicate that highly functional structures can be produced and that electrochemical performance is encouraging, which means there is a strong potential to improve membrane performance.

4. Membrane Electrode Assembly (MEA) Design Studies
The MEA is the critical core component of a PEM fuel cell, where hydrogen and oxygen react on the electrode surfaces to generate electrical energy. In these studies, factors that limit operational performance of MEAs under different operating conditions have been identified. The team discovered that proton conductivity of the cathode catalyst layer is a limiting factor under a range of operating regimes. This

discovery has steered the strategic research direction towards new proton conducting materials for catalyst layers and new concepts of catalyst layers that could significantly enhance performance.

5. Hydrogen Storage
An international team led by researchers at NRC-SIMS published a milestone paper in *Nature* that outlines how hydrogen can be stored more safely for fuel cells. They showed that by adding just a touch of stabilizer twice as much hydrogen could be stored compared to any previously published studies into a gas hydrate framework. Hydrates are ice-like substances found offshore on the continental margins in permafrost. They represent one of the world's largest untapped reservoirs of energy and, according to some estimates, have the potential to meet global energy needs for the next thousand years.

In 2005-2006, 58 papers were published in refereed scientific journals, and six new patent applications were filed by the horizontal program. Discussions are in progress concerning the formation of a spin--off company. At NRC-IFCI a number of workshops as well as a round table were organized, attracting broad participation from industry and academic stakeholders.

NRC Research Institutes involved:
NRC-IMI, NRC-IFCI, NRC-ICPET, NRC-IMTI, NRC-SIMS, NRC-IRC

Website: http://ifci-iipc.nrc-cnrc.gc.ca/about.html

Perform R&D in sectors that contribute to fostering sustainability

Continue to support Canada's commitment to reduce Greenhouse Gas emissions and improve the environment[11] – NRC-IRC researchers have developed a framework for the life-cycle analysis and sustainability assessment of High Performance Concrete (HPC) Structures incorporating industrial waste products (e.g., fly ash, slag) as supplementary cementing materials, enabling its use in high-performance concrete applications.

The First Canadian Residential Fuel Cell, installed at the Canadian Centre for Housing Technology (CCHT) in February 2005, operated through 2005-2006. The fuel cell generated electricity for the house, exported electricity to the grid, and generated heat for hot water and space heating. Performance analysis of data continues and final reporting is to follow.

Fiscal year 2005-2006 was a year of transition for the Infraguide project, as staff prepared and delivered their Financial Sustainability Action Plan, moving towards a sustainable operational model and securing resources to meet planned objectives. InfraGuide is both a national network of experts and a growing collection of published best practice documents for use by municipal decision makers and technical personnel in the public and private sectors. In 2005-2006, NRC completed three best practices, prepared five technical case-studies and delivered three regional seminars.

In addition to the work reported earlier in this document for NRC-GTERC, NRC-IAR-Aerodynamics

[11]As a Schedule II (*Financial Administration Act*) departmental corporation, NRC is not subject to the 1995 amendments to the *Auditor General Act* requiring the preparation of a Sustainable Development Strategy. However, NRC has an Environmental Management Policy to ensure that its operations contribute to sustainable development. NRC fosters the integration of sustainable development strategies and practices across Canada and in the innovation processes of Canadian SMEs.

Laboratory competed for and was awarded $300K of funding from the Climate Change Technology and Innovation Program for a full-scale wind tunnel study aimed at the use of add-ons for reducing aerodynamic drag, and therefore fuel burn, on transport trucks and trailers, and dissemination of the results to manufacturers and users. Testing on various devices, including those developed by NRC-IAR and others, suggests fuel savings of 10,000 litres/vehicle/year. Adoption of these technologies would reduce total Canadian greenhouse gas emissions by 0.5%. The program has links to Canadian companies that develop such technologies; the Canadian Trucking Association which has promised to provide fleet operators for in-service evaluations; and to a much larger US Department of Energy (DOE) program.

Build sustainability through oceans science – Over the past year, NRC-IOT provided new results on performance in the ocean environment to assist the Department of National Defence with naval operations; to support Transport Canada in marine safety regulation; and to guide Natural Resources Canada in the development of energy policy. NRC-IOT has also provided technical expertise to national oceans organizations that are facilitating technology transfer to ocean technology SMEs. NRC-IOT is developing leading-edge technologies that will enable Canada to implement its Ocean Action Plan, as well as transferring these technologies to Canadian companies.

Support Canadian industry through codes and standards

Harmonize international measurement standards – The growing globalization of trade and the rapid development of new technologies that require measurement standards depends on the activities of national metrology institutes (NMIs) all over the world. NRC-IMNS is Canada's NMI, determining standards and methods of measurement that impact directly on the ability of Canadian firms to trade internationally. On behalf of Canada, NRC-INMS participates on the Comité international des poids et mesures (CIPM) whose activities are aimed at achieving recognition of common measurement standards and of calibration and measurement certificates issued by the 50 signatory countries. In 2005-2006, NRC-INMS participated in 29 inter-NMI comparisons to establish measurement equivalence and a further 9 comparisons under the auspices of the Inter-American Metrology System (SIM). These activities provide the basis for a uniform global metrology system, facilitating Canadian competitiveness in the global marketplace. As a service to Canadian industry, NRC-INMS's Calibration Laboratory Assessment Service (CLAS) adheres to the ISO/IEC 17025 quality system in providing certification to public and private calibration laboratories seeking accreditation to ISO/IEC 17025 by the Standards Council of Canada.

An ultra high-temperature blackbody is a rare physics tool now being readied at NRC-INMS in Ottawa and will be one of the world's most accurate ways to measure ultraviolet (UV) light. With the blackbody, NRC will be able to improve its calibration uncertainties up to ten fold. This will open the door to new collaborative R&D opportunities with Canadian industries that are developing UV-dependent technologies and provide much needed traceable calibration services.

Objective-based codes for construction: Uniformity, safety and cost reduction – The printed versions of the 2005 model national construction codes were published in September 2005 in a new objective-based format. Approximately 18,000 copies of the new 2005 codes have been sold to date and the reaction from construction industry stakeholders is very positive. The electronic versions will be published during summer 2006. Provinces and territories have initiated the process of adopting the 2005 model codes, which should be completed in most jurisdictions by the

end of 2006. To inform code users of the most significant changes, NRC-IRC's Canadian Codes Centre in coordination with the provinces and territories held a series of seminars in 16 cities which were attended by over 6,100 participants. To facilitate the transition to objective-based codes, training material was developed in partnership with Canada Mortgage and Housing Corporation (CMHC) and the provinces and territories. This material will be delivered by the provinces and territories within their jurisdictions.

Maintain effective stewardship of Canada's investments in large-scale R&D infrastructures

Leverage "Big Science" partnerships – TRIUMF (Tri-University Meson Facility) constitutes one of the country's key investments in "Big Science" infrastructure. It provides world-class facilities for research in sub-atomic physics, nuclear physics, nuclear astrophysics, life sciences and condensed matter and promotes the transfer of technology developed at the laboratory to the Canadian marketplace. The Federal Government funds TRIUMF through a contribution agreement between TRIUMF and NRC. TRIUMF has completed its first year (FY2005-2006) of the 2005-2010 Five Year Plan totalling $222.3 million over the five years. Further details on TRIUMF's major accomplishment in 2005-2006 can be found in Table 3-10.

The Herzberg Institute for Astrophysics (NRC-HIA) plays a seminal role in the implementation of Canada's Long Range Plan for Astronomy and Astrophysics (LRP). In contributing to the LRP, NRC-HIA is engaged in projects that will form the basis for future ground-based astronomy planned to be operational by 2010. Foremost among these is the Atacama Large Millimetre Array (ALMA), a millimetre wavelength telescope being built collaboratively by European and North American partners, in cooperation with Chile. NRC-HIA is developing innovative instrumentation for ALMA including construction of the most powerful correlator in the world. In addition, NRC-HIA provides design and development support for the Thirty Metre Telescope (TMT) which will be the largest telescope ever built, to be fully operational in 2015. This project is a Canada-US partnership. Further details on NRC-HIA's major accomplishment in 2005-2006 can be found in Table 3-10.

The Canadian Neutron Beam Centre (NRC-CNBC) is a unique and powerful tool for materials research, one of about 20 facilities world-wide, and a key part of Canada's science infrastructure. During 2005-2006 NRC-CNBC enabled 134 experimental projects, the majority for external clients. Twenty three projects were industrial research conducted on a fee for service basis, for 7 different clients. An NSERC Major Facilities Access Grant of $1 million helped enable 167 individual researchers to be involved in 111 experiments, with over half led by researchers from Canadian universities.

The facility was used for a world-first experiment where neutron powder diffraction was used to analyze the structure of irradiated uranium-molybdenum nuclear fuel for research-reactor applications. NRC and Atomic Energy of Canada Limited (AECL) expertise was combined to develop specialized scientific equipment that allowed highly radioactive material to be placed safely on a NRC-CNBC neutron diffractometer. Initial results show that U Al_x is present in the irradiated fuel, warning of the difficulties of using aluminium in this application. This work contributes to an international activity to develop U-Mo fuel for research reactors, which will help reduce stockpiles of used fuel world-wide. This could represent an important business opportunity for Canada as well as a contribution to non-proliferation.

Since neutrons can be used to gain information on almost any kind of material, NRC-CNBC

regularly works with a wide range of clients seeking detailed information on materials and their properties. This year, NRC-CNBC provided support to two forensic investigations to provide answers on what led components to fail – in one case causing a domestic fire, in another causing a railroad accident. Lessons learned from such research help to increase public safety in the future.

This year has seen new investment in the facility through a Canada Foundation for Innovation (CFI) grant to the University of Western Ontario with 13 university partners for a neutron reflectometer that will open up new avenues for research in thin films, surface science and nanomaterials. NRC-CNBC has actively been fostering this capability for over ten years, initially reconfiguring a spectrometer as a reflectometer to allow scientists to study thin films and surfaces. The widespread support for the funding is an indicator of the growing strength of the scientific community in this sector and demonstrates NRC-CNBC's capability to make unique tools available to Canadian scientists and to support the development of new, specialised communities.

Priority 2 Technology and Industry Support: Serving as a Catalyst for Industrial Innovation and Growth

In today's innovative, knowledge-based economy, improved and novel materials, processes and technologies are critical to Canada's success in increasing its productivity, creating wealth, and being globally competitive. R&D investments are a key indicator of our ability to generate and apply new knowledge and technologies. In 2005-2006, NRC built upon its critical mass and expertise in key technology and business support facilities and services across Canada to strengthen innovation and growth in Canadian businesses and developed strategic initiatives to help Canadian businesses better compete in the global marketplace.

Performance Indicators (as identified in the 2005-2006 RPP)	• Technology transfer • Knowledge dissemination • Highly qualified personnel to Canada • Client success • Economic, social and environmental impact

Not all performance indicators are reported on annually.

NRC's Commercialization Branch, created in April 2004, to explore strategic collaborative initiatives with partners and develop pilot projects to demonstrate NRC's enhanced capabilities for commercialization was restructured in March 2005 into two offices: the Business Portfolio Office (NRC-BPO) and the Intellectual Property Services Office (NRC-IPSO). The Business Portfolio Office focuses on core technology transfer; intellectual property (IP) management and commercialization; IP portfolio management; licensing; and new venture creation and maintenance in support of cross-council commercialization activities. The NRC-IPSO is responsible for intellectual property protection, maintenance of NRC patent portfolio and license administration. These two offices report directly to the Vice-President Technology and Industry Support.

Increase the innovation capacity of small and medium-sized enterprises (SMEs): Growing SMEs to medium-sized enterprises (MSEs)

Program Spotlights

Grow SMEs through innovation capacity support and expertise

Industrial Research Assistance Program (NRC-IRAP)

Description: NRC-IRAP is NRC's innovation and technology assistance program in support of Canadian SMEs. Since its inception close to 60 years ago, the Program has broadened its strategic purpose from a limited focus on technology transfer to its current strategic objective of increasing the innovative capabilities of Canadian SMEs. Today NRC-IRAP provides comprehensive innovation assistance to technology-based SMEs in almost every industrial sector of importance to Canada's current and future economic development.

Plans from the 2005-2006 NRC RPP: SMEs engaging in high-risk, technologically sophisticated R&D face increasingly complex challenges. NRC-IRAP will support these SMEs in their technology projects to assist firms in growing and becoming more competitive. By focusing on: increasing the rate of growth of SMEs; increasing the number of SMEs that successfully commercialize their products, services and processes; increasing the number of SMEs that reach and compete in new markets; and concentrating on firms with an international marketplace orientation.

Pilot Program for SME Commercialization of Federal S&T – Working with NRC's Commercialization Branch, NRC-IRAP will initiate a pilot program and provide seed funding to assist SMEs in commercializing R&D from universities, colleges, and government laboratories.

In addition, NRC-IRAP has partnered with the Canada Institute for Scientific and Technical Information (NRC-CISTI) in a pilot program to provide Competitive Technology Intelligence (CTI) to firms via NRC-IRAP Industrial Technology Advisors. As a next step in this initiative, NRC-IRAP will establish an in-house capability to capture CTI and integrate this information into the advice and services provided to firms – ultimately resulting in better planning and business strategies for clients.

Financial Resources ($ millions)

Planned	Total Authorities	Actual
$158.2	$167.3	$160.2

Planned Results:

- To increase the innovation capacity of Canadian SMEs
- To become the national enabler of technological innovation for Canadian SMEs

2005-2006 Performance:

Commercialization Program – In March 2004, the Federal Budget allocated to NRC funding to "strengthen support for NRC's regional innovation and commercialization strategies." The funding was provided to NRC-IRAP in the amount of $5M annually for five years. This funding was received starting in May 2005 and was divided among contributions to organizations, salaries and operational funds, over a four year period. In FY 2005-2006, the resource division was $3M contribution funds, $1.35M salaries and $0.65M operating funds.

As part of this commercialization effort, NRC-IRAP undertook a number of actions and initiatives in 2005-2006 to put in place programs and partnerships. For example, Biomedical Commercialization Canada Inc. (BCC) was created in Winnipeg in partnership with NRC-IBD, governments, academia and the private sector. BCC is a not-for-profit organization that is managing the delivery of commercialization programs within the NRC-IBD Industry Partnership Facility.

Another example is BioMed City, which was established in partnership with universities and colleges, research hospitals, private research institutes, leading firms, financial institutions, venture capital firms, regional development organizations and municipal, provincial and federal governments. The BioMed City initiative is a not-for-profit organization and is a strategic attempt to capitalize on the federal and provincial governments' investment to make Winnipeg Canada's community of excellence for public health research and innovation in Canada. NRC-IRAP signed a contribution agreement with the International Centre for Infectious Diseases to assist in the development and implementation of BioMed City.

Competitive Technical Intelligence (CTI) – NRC-IRAP continued its partnering efforts with NRC-CISTI across the country to provide SMEs with CTI services. See page 32 (under NRC-CISTI) for details on progress.

NRC Research Institutes involved:
NRC-IRAP partners with all NRC Institutes to support technology projects that meet SME needs and that are aligned with the technology focus of the Institutes.

Website: http://irap-pari.nrc-cnrc.gc.ca/english/main_e.html

Provide competitive technical intelligence and national scientific, technical and medical *(STM) information system*

Canada Institute for Scientific and Technical Information (NRC-CISTI)

Description: As Canada's national science library and the largest Canadian publisher of scientific and technical information, NRC-CISTI plays a crucial role in assuring that Canadians have ready access to the world's scientific, technical, and medical (STM) information.

Plans from the 2005-2006 RPP: NRC-CISTI will expand its information services to support SMEs through patent analysis services and a comprehensive CTI program offered in partnership with NRC-IRAP and NRC Institutes. Companies in NRC IPFs are key clients and will be offered enhanced services to support their R&D activities. To assure Canada's place in the digital STM information world, NRC-CISTI will build a national STM information system that will provide Canadians with universal, seamless, and permanent access to STM information resources. Partnership will be key to developing this system that will include content, tools, information expertise, and a national infrastructure.

Financial Resources ($ millions)

Planned	Total Authorities	Actual
$48.8	$51.6	$49.4

Planned Results:

- An integrated national and international network of scientific, technical, and medical information resources that is readily accessible to Canadians
- Information services that contribute to successful commercialization activities across Canada
- A viable Canadian scientific publishing system that supports research communication across Canada and around the world

2005-2006 Performance:

Finances – In 2005-2006, NRC-CISTI's total income was $22.9 million (a 4.7% decline from last year) and expenditures were $46.5 million, resulting in 49.3% of expenditures being covered by income.

Canada's Collection of STM Information – NRC-CISTI has one of the largest collections of STM information in the world. In 2005-2006 it maintained its print collection at levels similar to those of the previous year with 48,470 scientific journals, of which 8,803 were active subscriptions. The collection also includes 736,416 monograph titles and a large collection of technical reports. In alignment with the transition from print to digital information, NRC-CISTI has access to 5,108 electronic journals, an 8.3% increase from last year, and provides access to 17,800 web-based resources, a 10% increase. In 2005-2006, NRC-CISTI loaded over 3 million full text articles onto its servers, for a total of over 5 million STM articles in its digital repository.

Competitive Technical Intelligence (CTI) – In response to a growing demand for more analysed and action-oriented information, NRC-CISTI has been working with NRC-IRAP to develop the capacity to provide CTI service. The goal of this activity is to provide decision-makers in technology-based small businesses with patent information, technology scans, potential partnerships, research investment options, and analysis of technological trends to position them to maximize their results and return on investment in R&D. CTI is key to viable economic outcomes in a sophisticated and competitive global business environment.

In 2005-2006, NRC-CISTI expanded its CTI service, creating more technical business analyst positions requiring both science and business degrees, for a total of eight, to serve additional NRC-IRAP SME clients, NRC Institutes and cluster initiatives. These included the NRC Centre for Surface Transportation Technology (Ottawa), the National Institute for Nanotechnology (Edmonton), the Life Sciences, Medical Devices cluster initiative (Winnipeg), the NRC Institute for Information Technology (Fredericton), and NRC-IRAP in the Quebec and Atlantic regions.

NRC-CISTI's integrated information intelligence services combine the skills of information specialists and technical business analysts to gather and analyse business-related information. Sophisticated information analysis software tools enable NRC-CISTI to offer clients Strategic Technical Information Analysis (STIA). The result is a report that helps decision makers confirm the potential value of R&D projects and develop strategies that will translate public investments in technology into wealth for Canadian companies. Several companies and NRC Institutes have used the information provided in comprehensive CTI reports to form partnerships for funding or marketing; to decide for or against investment in further development of the technology; or to focus on a particular niche where the prospects of success are greatest.

Document Access and Delivery – Document delivery, one of NRC-CISTI's main information distribution channels, provides significant revenue to support NRC-CISTI's activities. Increasingly, NRC-CISTI's clients expect to search for and access digital sources of information from desktop computers. In 2005-2006, a three-year action plan outlined a vision and roadmap to renew NRC-CISTI electronic access and content delivery services. NRC-CISTI is enhancing its infrastructure and document delivery systems to align with the trend to desktop access to STM information.

Information on NRC-CISTI's service standards can be found in Table 3-8. Client feedback indicates a high level of satisfaction with NRC-CISTI's document delivery services to clients around the world. For the second year in a row, the Outsell Inc. survey of enterprise buyers from the corporate, not-for-profit, government, education, and healthcare sectors ranked NRC-CISTI top overall for document delivery.

Building Canada's Scientific Infostructure – As Canada's national science library, NRC- CISTI has a key role as leader and catalyst in building universal, seamless and permanent access to information for Canadian research and innovation. To help achieve this vision for Canada, in 2005-2006 NRC-CISTI

established a three-year program called Canada's scientific infostructure (Csi) that will create a national information infrastructure and opportunities for collaborations with partners to support research.

Under Csi, NRC-CISTI is developing the technological infrastructure to store digital resources on its servers and provide the Canadian research community and clients worldwide with direct access from their desktop computers. NRC-CISTI has built a reliable technology platform with expandable storage capacity to store digital content for the long term. A memorandum of understanding between NRC-CISTI and Library and Archives Canada (LAC) was signed to ensure business continuity through a backup server located at LAC in the event of power disruptions affecting access.

As part of the Csi program, NRC-CISTI is negotiating with publishers for the rights to load the full-text e-journals onto its servers. This will create a database of STM information that is envisioned to be used for advanced text-mining and information analysis once the software tools are developed.

The Csi program is based on developing partner relationships to increase the digital repository and to develop the technology infrastructure. NRC-CISTI will continue to establish partnerships with libraries in Canada and around the world to provide its clients with access to resources it does not own but that are important to its mission.

Global Reach of NRC Research Press Journals – As one of the world's leading STM libraries and Canada's largest scientific publisher, NRC-CISTI is building a knowledge network with links to other major STM information institutions around the world. NRC-CISTI also plays a growing role in providing access to STM information resources to developing countries to further their research and innovation activities.

Through the Programme for Enhancement of Research Information (PERI), NRC Research Press partnered with the Health InterNetwork Access to Research Initiative (HINARI) – part of the World Health Organization – and Access to Global Online Research in Agriculture (AGORA) to provide free or very low cost online access to its 16 journals to local, not-for-profit institutions in developing and transitional countries. In 2005-2006, 11 countries subscribed to the Press' journals through this program (Bangladesh, Malawi, Pakistan, Georgia, Tanzania, Rwanda, Cuba, Bolivia, Kenya, Sri Lanka, and Zambia). The NRC Research Press participation in this program reflects Canada's and NRC's longstanding commitment to researchers in developing countries, and advances the goal of making Canadian scientific research more widely available.

NRC Research Press Monographs Program – NRC-CISTI's NRC Research Press published nine research monographs in 2005-06, including the books Coleoptera Histeridae: The Insects and Arachnids of Canada, Part 24, and Petite flore pour les longues fins de semaine dans l'est du Canada et le nord-est des États Unis.

The Wildlife Society selected *Blue Grouse: Their Biology and Natural History*, an NRC Research Press monograph, as the 2005 recipient of the Wildlife Publications Award for Outstanding Monograph.

The Press strengthened its position in the e-book market by making more books available in electronic format and by signing agreements with Canadian e-book and book distributors

NRC Research Institutes involved:
NRC-CISTI partners with the outreach activities of all NRC Institutes to promote and deliver an integrated package of scientific and technical information services to support Canadian firms.

Website: http://cisti-icist.nrc-cnrc.gc.ca/cisti_e.shtml

Develop strategic initiatives in support of competitiveness/commercialization

Public-private partnerships for SMEs and industrial clusters – NRC has put in place a number of partnerships that help Canadian technology-based SMEs and industrial clusters accelerate the successful commercialization of technology applications. These partnerships improve Canada's economic performance internationally and help to grow more medium-sized firms in Canada. To date, NRC has contributed substantial investments in various industrial clusters across Canada and has also attracted private investments. NRC's strategy is to build on the strengths of both the public and private sectors – nationally, regionally and at the community level.

Improve Intellectual Property Management

Streamline NRC's Intellectual Property Management – Based on a 2003 benchmarking study of best practices in Intellectual Property (IP) management in NRC's research Institutes and with other leading research-based organizations in Canada and abroad, NRC continued to streamline the management of IP. Specific activities in 2005-2006 included the provision of the services of patent agents from NRC's Intellectual Property Services Office (NRC-IPSO) to Institutes to help focus on high-value IP and provide advice on IP portfolio decision-making. Evidence of this focused approach is the decrease in patent applications in 2005-2006 due to more strategic selection of inventions to patent versus choosing to patent all discoveries (see Figure 2-1).

Throughout 2005-2006, the NRC Business Portfolio Office (NRC-BPO) continued to improve marketing and communications of technology transfer opportunities to attract new business partners; enhance management and decision-making support tools; and adopt world standard best practices and evaluation tools. NRC-BPO worked with several Institutes to facilitate the integration of IP management strategies in Institute strategic plans.

Maximize commercial value of NRC S&T/R&D investments

Facilitate, manage and negotiate on behalf of NRC the creation of new companies and the licensing and patenting of technologies – In 2005-2006, NRC-IPSO recruited experienced private sector mentors to its *Business Case Challenge* to provide "hands on" coaching to technical leaders in developing business ventures. New mentors included the Dean of the School of Management at the University of Ottawa.

In 2005-2006, NRC's Business Portfolio Office, in collaboration with a technology industry executive and business professor, developed a workbook to help NRC researchers and the NRC business community turn good ideas into great opportunities. The workbook, entitled, *So What? Who Cares? Why You?* ™, is aimed at "scientists, researchers, engineers and technology entrepreneurs looking to bring their ideas from the lab to life."

Extend existing metrics to measure commercialization performance

Establish commercialization metrics for NRC reflective of emerging government performance frameworks – As part of the implementation phase of its Renewal Initiative, NRC launched a comprehensive review of NRC business activities to ensure the right business activities and the right support for these activities is in place in the future. The project will review business activities (defined as all NRC activities interfacing with clients external to NRC) and all support to these business activities. One of the activities in this project is to prepare a commercialization report card.

Priority 3 Enhancing Development of Sustainable Technology Clusters for Wealth Creation and Social Capital

Increasingly, communities and regions are emerging that have systematically built, through careful planning and the cooperation of local stakeholders and governments, dynamic economies based on niche technology fields. When successful, technology clusters can grow exponentially to full maturation over a 15 to 20 year period.

With its vast geography, relatively small population and the predominance of SMEs, Canada faces unique economic challenges. Over the last five years, the Government of Canada has provided resources to support emerging technology clusters in a number of communities across Canada. With the initiatives still in their early developmental stages, NRC continues to nurture their growth by encouraging more involvement, commitment, and leadership from cluster partners.

NRC is committed to catalyzing the growth of community based technology clusters across Canada. NRC's technology cluster strategy builds on existing local strengths by developing and transferring NRC R&D capabilities to industry, pulling together community strengths and supporting SMEs through specialized facilities, NRC-IRAP and NRC-CISTI. The ultimate benefit for Canadians will be the emergence of globally competitive, community-based technology clusters leading to higher productivity, new jobs, and expanded trade.

Performance Indicators (as identified in the 2005-2006 RPP)	• Community participation (e.g., involvement of municipal/ provincial/ private sector stakeholders) • Incubating firms and co-locating firms • Investment to the cluster • Venture capital to the cluster • New companies to the cluster

Not all performance indicators are reported on annually.

PERFORMANCE HIGHLIGHTS

Build on success and lessons learned from current technology cluster investments and efforts

Build on successes from NRC's Atlantic Initiatives – While the rate of progress has varied in each cluster community in which NRC is involved, the results of NRC's early-stage evaluation of technology cluster development in Atlantic Canada, completed in 2004-2005, is assisting in the ongoing management of NRC's cluster initiatives across the country. Below are some examples of progress.

- Information Technology (New Brunswick): NRC-IIT continued to grow its linkages in New Brunswick. In 2005-2006, NRC-IIT participated in numerous local networks including Innovation Fredericton, the New Brunswick Research Network and the Translation Industry Stakeholders to develop collaborations and stronger research capabilities in the province. NRC-IIT is partnering with the University of New Brunswick, the University of Moncton, the New Brunswick Innovation Foundation, Beausejour Medical Institute and Dalhousie University to form the Cancer Populomix Institute for collaborative research to enhance Canadian capabilities in early cancer detection. NRC-IIT also worked closely with the Atlantic Canada Opportunities Agency (ACOA) to identify SME and university projects with a high degree of commercial potential. Where feasible, ACOA and NRC-IIT align resources to collaborate on these projects. As part of its facilitation role, NRC-IIT continues to host networking events that bring together key stakeholders in the region.

  In 2005, NRC-IIT opened five leading-edge IT and e-Business research labs in Fredericton, in addition to an Advanced Collaborative Environment Lab in Moncton. Both facilities provide invaluable incubation space and mentoring services to the cluster's SMEs.

- Life Sciences (Halifax, Nova Scotia): NRC-IBD (Atlantic) is one of the driving forces in large scale collaborative partnerships between NRC, Dalhousie University, the Izaak Walton Killam Hospital (IWK) and the Queen Elizabeth II Health Sciences Centre (QEII). A partnership between NRC-IBD, NRC-IMB, and the IWK Hospital has resulted in the creation of a new research facility, the Biomedical MRI Research Laboratory (BMRL). This multi-user lab will host a 7 tesla vertical bore magnet for micro imaging studies and a 3 tesla horizontal bore magnet for small animal MRI. The lab will be equipped for a wide array of MRI studies including drug development and delivery, and cellular/molecular imaging.

  NRC-IBD (Atlantic) has been building strong links with the key players in biomedical research and commercialization in the Halifax area. In 2005-2006, NRC-IBD (Atlantic) co-hosted an open house with the Nova Scotia Health Research Foundation (NSHRF), held meetings with NSHRF on building imaging capacity in Halifax and served on the NSHRF Merit Awards Committee for capacity and innovation grants.

  Research and commercialization collaborations are ongoing with researchers at Dalhousie University, University of New Brunswick, and the QEII Hospital and also with NRC-IRAP, NRC-IMB and the NRC Institute for Nutrisciences and Health (NRC-INH). The strategy to embed NRC Institutes directly within tertiary care hospitals has led to a number of unique opportunities. In neurosurgery, functional MRI has now been used to assist in planning for the resection of tumours – one of the few cities in Canada to integrate state-of-the-art functional imaging. In radiology (together with law and ethics), the interface between basic scientists and clinicians has led to neuroethics projects that examine how rapidly evolving imaging technologies are transforming health care and research. Halifax has since become one of the world centers for the emerging field of neuroethics.

  NRC-IMB's long-term partner, Acadian Seaplants Ltd. (ASL), was awarded a 2006 Nova Scotia Export Achievement Award for "Export Growth through New Markets" for its successes in developing novel products form seaweeds and developing large international markets. ASL exports seaweed based products to more than 70 countries worldwide. NRC-IMB's affiliation with ASL extends back several years and is highlighted by the Nova Scotia life sciences industry association, BioNova, awarding one of NRC-IMB's researchers with its Annual

Research Excellence Award in 2005, for "lifetime of outstanding achievement working with industry in the field of marine algae and seaweed." Much of NRC-IMB's work in this area has been commercialized by ASL and NRC-IMB continues to provide valuable expertise to the company.

A roadmapping exercise to set strategies for the next five years for the Halifax Cluster is being undertaken by the biotechnology industry association, BioNova, to ensure adequate involvement of the industry. NRC-IMB and NRC-IBD are participants in this exercise.

- Ocean Technologies (St. John's, Newfoundland and Labrador): Under a renewed Atlantic Initiative Partnership, NRC-IOT delivers programs aimed at identifying and meeting the innovation needs of local businesses in the ocean technology sector. The Ocean Technology Enterprise Centre (OTEC) houses nine companies developing new technologies with NRC support. During the year, three companies graduated from OTEC including one from the Young Entrepreneur Program. OceansAdvance, the cluster organization initiated by NRC and now run by the private sector, is leading the transition to an industrially-led cluster. Provincial and municipal cluster strategies contain actions and metrics that are aligned with NRC-IOT's Atlantic Initiative plan and recognize the Institute's role in the innovation system.

  A multi-year research collaboration, in which NRC-IOT is involved, continued to earn praise for its exhaustive evaluation of marine safety systems under extreme environmental conditions. With partners in industry, regulatory and rescue agencies, research and government, the results of the project are being used to formulate guidelines for approval of safety equipment, while spinning out new technology opportunities to the private sector.

From birth to emerging – Moving cluster activities forward – The majority of NRC's recently launched cluster activities are still in the early development stage, focused on establishing facilities and attracting skilled human resources, building networks of public and private sector partners and providing R&D support. In 2005-2006, NRC continued to foster their development into the emerging stage by developing a solid base of networks/ partners, strengthened infrastructure, highly qualified researchers and strategic R&D support. NRC also continued its involvement in mature clusters such as plant biotechnology in Saskatoon and biopharmaceuticals in Montreal. The following are examples of cluster activities in which NRC was involved that took place in 2005-2006:

- Nanotechnology (Edmonton, Alberta): Jointly funded by the federal government, the University of Alberta and the Government of Alberta, the National Institute for Nanotechnology (NINT) is an integrated, multi-disciplinary institution involving researchers in physics, chemistry, engineering, biology, informatics, pharmacy and medicine. This past year, NINT staff participated in numerous outreach activities focused primarily on industry as a means of making links to Albertan companies that will benefit from NINT research. NINT co-sponsored the 2005 International conference on Micro-Electro-Mechanical Systems (MEMS), Nano and Smart systems (ICMENS) with the University of Alberta and the University of Calgary. This international conference brings together top researchers in these fields and emphasizes the industrial applications of their research. Industrial interactions will increase when the Industrial Partnership Facility at NINT becomes operational in 2006-2007. In 2005-2006, talks took place with both the University of Lethbridge and the University of Calgary to broaden collaborative relationships beyond Edmonton. NINT organized Canada's second Nanoscience and Nanotechnology Forum in Montreal in June 2005. This annual event showcases

Canadian nanoscale research excellence and promotes networking among the Canadian nano-research community.

NINT and University of Alberta researchers developed the sharpest tip ever known for use as a sensing probe in scanning tunnelling microscopy (STM). A single atom wide, the new probe provides the smallest electron point source ever for STM. The researchers used tungsten atoms to form a sharp or high aspect ratio pyramid that was stabilized with a single-atom coating of nitrogen. Along with STM, the probe has potential applications in atomic force microscopy (AFM) and could also be used as a physical probe for nanoscale manipulation or for nanoscale point contacts with metals and semiconductors. The probe also has potential to be a very precise source for electron beams and provide stronger image magnification for scanning electron microscopy (SEM) and transmission electron microscopy (TEM).

The official opening of NINT's new building took place in the summer of 2006, launching state-of-the-art facilities that position NINT as a unique and desirable place to work. With the completion of the building, NINT will continue to actively recruit highly qualified staff internationally to lead research in nanoscience related to energy, life sciences and information and communication technology and to provide training opportunities for a new generation of highly qualified personnel in the nanoscience sector. Of the twenty principal investigators already at NINT, 14 are new to Alberta, evidence of NINT's ability to attract researchers. With its new facilities and its close collaboration with the University of Alberta, NINT expects to be able to attract the best in the world.

- Aluminium Technology (Saguenay, Quebec): The NRC Aluminium Technology Centre (NRC-ATC) in the Saguenay – Lac-St-Jean Region officially opened in November 2004. NRC-ATC provides Canadian industry with the expertise and technical support needed to develop high valued-added aluminium products and services. NRC-ATC develops, in concert with its partners, leading-edge technologies attractive to the aluminium parts manufacturing industry and supports development of the transformation industry in Canada. Its research programs include a focus on two main platforms: molding and forming; and joining and surface treatment.

  In 2005-2006, NRC-ATC and Alcan combined their expertise to develop a breakthrough aluminium high-pressure die casting process, based on an Alcan patented semi-solid slurry technology. The process, known as SEED, has reached the pre-production stage in a commercial foundry, with parts being qualified for automotive structural applications. A commercialization plan is in place and installation of the first commercial units is expected in 2007. The SEED production cells will be designed and marketed by a Canadian equipment supplier. The commercialization of SEED automotive parts will have direct commercial benefits for the Canadian aluminium industry, as well as contributing to weight reduction of cars and cutting greenhouse gas emissions.

  In a joint project with General Motors of Canada and Alcan, NRC-ATC demonstrated that the use of laser-MIG hybrid welding could increase the productivity and improve the quality of automotive aluminium engine cradles, which are 50% lighter than their steel equivalents. Approximately 300,000 aluminium engine cradles are produced every year for the single car platform involved in the existing study. Technology and concepts developed in this project will now be applied to the design of new aluminium cradle concepts for the 2009-2010 commercial platforms.

- Urban Infrastructure (Regina, Saskatchewan): With partners including the City of Regina, the University of Regina and Western Economic Diversification Canada, the Centre for Sustainable Infrastructure Research (NRC-CSIR) is well on its way to establishing a research network and program to serve as a catalyst for the growth of a regional technology cluster in the area of sustainable infrastructure and sustainable cities. Specifically, NRC-CSIR has 13 continuing and term staff and 8 strategic projects underway in the areas of decision support systems for sustainable infrastructure, condition assessment of buried utilities and urban roads, and water quality monitoring and modeling in water distribution systems and wastewater networks - these projects initially involve the City of Regina as a partner, some have University of Regina collaborators and work is ongoing to involve more industrial partners.

- Biosciences (Charlottetown, Prince Edward Island): NRC-INH created a New Business Attraction team for the Prince Edward Island (PEI) biosciences cluster. This group comprised of senior business development representatives from NRC-INH, PEI Business Development/Tech PEI, ACOA, PEI BioAlliance and University of Prince Edward Island. The focus of the group will be to provide a coordinated and professional approach to attracting new companies to the PEI cluster.

- Nutraceuticals (Saskatoon, Saskatchewan): In 2002, NRC-PBI received $10 million to create a 5 year research program in support of product development and processing of new crops targeted to the nutraceutical/ functional food/plant-made pharmaceutical market. The vision for the program is to enhance the innovative capacity and competitiveness of the Canadian plant-based natural health products industry for the health and wellness of Canadians. The Institute is currently working on projects that address various disease states including neurological disorders, brain and tissue health, malaria, and cardiovascular disease.

Focus on growth through integrated community partnerships

Encourage more involvement / commitment of cluster partners – In 2005-2006, NRC continued to follow up on lessons learned identified in the evaluation of Atlantic Canada initiatives (completed in 2004-2005) and built upon existing partnering successes, such as:

- Medical Devices Technologies (Winnipeg): In 2005-2006, NRC-IBD celebrated the opening of its Industry Partnership Facility (IPF), the Centre for Commercialization of Biomedical Technology (NRC-CCBT). In conjunction with NRC-IRAP, NRC-IBD developed a strategy for entrepreneurship and commercialization support that resulted in the formation of Biomedical Commercialization Canada, Inc. (BCC). BCC began its efforts to seek out promising young companies to mentor. Several firms and non-profit organizations, that will provide services to companies, moved into the new facility.

  NRC-IBD was active in the biotechnology sector, participating as a member of the Manitoba Pavilion at BIO2005 and as members of the Steering Committee of the Manitoba Business of Science Conference. NRC-IBD was also involved in TechMed 2006, with staff on the Promotions Committee and on the Judging Panel.

  NRC-IBD partnered with NRC-IRAP and NRC-CISTI in the creation of Medical Technology Watch newsletter (http://www.medtechwatch.ca/) providing Canadian companies, researchers,

and investors with timely information on the medical technology industry in Canada. The newsletter keeps readers informed of upcoming events in the industry and provides a forum for SMEs and research organizations to exchange ideas and forge potential collaborations. The newsletter is published in both official languages, six times a year, and distributed to over 1800 individuals and organizations across Canada and internationally.

NRC-IBD has ongoing partnerships with other research institutions in Winnipeg, including the Public Health Agency of Canada; the Universities of Manitoba and Winnipeg; and Red River College. NRC-IBD continues to participate in the training program of Magnetic Resonance Technologists at Red River College.

NRC-IBD scientists in collaboration with the Ross Tilley Burn Centre are currently developing a near infrared (NIR) device to tackle the primary challenge in assessing and treating burns: determining the burn depth. The non-invasive device provides a painless way of "seeing" the depth and extent of skin damage by measuring the light absorbed by haemoglobin and water in the body's tissues. The device has the potential of helping physicians make diagnoses and to monitor post-surgery graft survival. It might also be used more widely to monitor wound healing in general or to monitor a patient's tissue water content.

- Photonics (Ottawa): The official opening of the Canadian Photonics Fabrication Centre (NRC-CPFC) took place in May 2005. NRC-CPFC is a collaboration of NRC, Carleton University and the Province of Ontario for an industry-grade photonics fabrication facility that provides value-added services to clients and a training program to build the next generation workforce for the Canadian photonics industry. NRC-CPFC's first year of operation had more clients than initially expected. In 2005-2006, the revenue generated was $1.65 million, and was used to cover the taxes, utilities and some operating costs. The first three start-ups that engaged NRC-CPFC in their early stages raised approximately $10 million in funding and increased their number of employees by a total of 19 people. In Ontario alone, NRC-CPFC partnered with CMC Microsystems to provide fabrication resources to 6 universities, 20 faculty and research staff and 21 graduate students. CMC Microsystems in co-locating its photonic process engineer at the NRC-CPFC building. NRC-CPFC continues to maintain close ties with the Ottawa Photonics Consortium, the Ottawa Photonics Research Alliance, the Ottawa Centre for Research and Innovation and the Ontario Photonics consortium as well as key players across Canada. Interactions with Canadian photonics clusters on a national basis (including the Réseau Photonique de Québec, the Ontario Photonics Technologies Industry Cluster in southern Ontario and the BC Photonics Industry Association) mean that NRC-CPFC is well connected to industry needs and trends.

  On the international front, NRC-CPFC is a founding member of the International Photonics Commercialization Alliance (ICPA), a North American coalition providing links among Canadian and American photonics organizations.

Expand network of Industrial Partnership Facilities (IPFs) – In support of its cluster development activities, in 2005-2006 NRC continued to develop, build and operate IPFs across Canada. These unique facilities are workplaces for collaborative research, for the incubation of new firms and NRC spin-offs and serve as community resources for access to mentoring, innovation financing and competitive technical intelligence for new enterprises. In 2005-2006, NRC IPFs had 116 incubating firms. The facilities occupied a total of 26,820 square metres of space. Below is an overview of current and planned IPFs.

Table 2-2: NRC's Industry Partnership Facilities – Current and Planned

Location	Total Area (m^2)	Status	Completion Date	% occupied
Institute for Ocean Technology (St John's, Newfoundland)	500	in operation	2003-2004	100%
Institute for Marine Biosciences (Halifax, Nova Scotia)	691	in operation	2004-2005	72%
Institute for Information Technology (Fredericton, New Brunswick)	1,000	in operation	2002-2003	78%
Biotechnology Research Institute (Montreal, Quebec)	9,800	in operation	1997-1998	100%
Industrial Materials Institute (Boucherville, Quebec)	2,180	in operation	2003-2004	80%
NRC Industry Partnership Facility, M-50 (Ottawa, Ontario), (shared facility with several Institutes)	1,581	in operation	1998-1999	99%
NRC Industry Partnership Facility, M-23A (Ottawa, Ontario), (shared facility with several Institutes)	297	in operation	2004-2005	14%
100 Sussex Industry Partnership Facility (Ottawa, Ontario), (shared facility with several Institutes)	509	in operation	2003-2004	95%
Institute for Biodiagnostics (Winnipeg, Manitoba)	477 1,520[1]	in operation in operation	1995-1996 2005-2006	76% 21%[2]
Plant Biotechnology Institute (Saskatoon, Saskatchewan)	7,314	in operation	2002-2003	97%
Institute for Fuel Cell Innovation (Vancouver, British Columbia)	600	in operation	1999-2000	67%
Herzberg Institute of Astrophysics (British Columbia) Penticton Facility Victoria Facility	 114 125	 in operation in operation	 2001-2002 2001-2002	 18% 0%
Institute for Chemical Process and Environmental Technology (Ottawa, Ontario)	112	in operation	1992-1993	90%
NINT Innovation Centre (Edmonton, Alberta)	2,700	construction	2006-2007	-
Institute for Nutrisciences and Health (Charlottetown, Prince Edward Island)	469	construction	2007-2008	-
Total	29,989			

[1] Space reported in 2004-2005 was incorrect.
[2] Lower occupancy is due to facility opening in October 2005.

Engage and link community groups through horizontal support: NRC-IRAP and NRC-CISTI

NRC cluster efforts are led by NRC Institutes, which possess the knowledge and expertise needed to build and sustain them. NRC-IRAP's role in cluster building and commercialization efforts is to focus on the firm-related elements of clusters ensuring that the resources firms need to grow are accessible and become the focal point of NRC's efforts.

NRC-CISTI has established NRC Information Centres (NIC) co-located at NRC Institutes. NICs offer STM and business-related information and analysis services to NRC researchers, companies located onsite and external clients in the region. Below are highlights of NRC-IRAP's and NRC-CISTI's contributions to clustering efforts in 2005-2006.

- *Atlantic Cluster Initiatives* - NRC-IRAP has ensured that regional initiatives are addressed using a pan-Atlantic approach. An example includes the creation of a new Icelandic-Canadian joint venture called Atlantic Abalone 2000 Inc. in partnership with NRC-IRAP, NRC-IMB, ACOA, Department of Fisheries and Oceans (DFO) and Icelandic partners.

  NRC-CISTI's Atlantic CTI team serves NRC-IRAP's industrial technology advisors, who in turn assist SMEs within the four Atlantic cluster initiatives to successfully commercialize technologies. The CTI team, consisting of information specialists and technical business analysts, has members located in Halifax, Charlottetown, Saint John, and St. John's.

- *Nanotechnology Cluster Initiative* - NRC-IRAP is engaging key stakeholders in the development of initiatives intended to support the growth of a nanotechnology cluster centred in Edmonton. Stakeholders include NINT, Western Economic Diversification, Alberta Innovation & Science, Alberta Research Council, Alberta Ingenuity Fund, University of Alberta and Edmonton Economic Development Corporation (EEDC). NRC-IRAP West is developing a collaborative initiative with EEDC that will strengthen the nanoMEMS cluster initiative that is anchored by NINT. The initiative involves the creation of the Alberta Centre for Advanced MNT Products (ACAMP) in Edmonton and supports the development of a collaborative Alberta network of nanotechnology-related organizations to advance the use of nanotechnology in firms. These initiatives will enhance the capability of firms in Western Canada and across Canada to use emerging nanotechnologies and strengthen the success of emerging companies.

  An NRC-IRAP Innovation and Network Advisor (INA) has been assigned to help NINT develop its contribution to the evolving Alberta Nanotechnology Strategy. Building on the strengths of Alberta's innovation system, this strategy will guide future provincial investments in the area. A key element is the unique partnership between the University of Alberta, the Government of Alberta and NRC that is represented in NINT in Edmonton. The strategy will reflect directions that need to be taken across Alberta.

  An NRC-CISTI technical business analyst provided service to NINT in the form of analysis in support of patenting decisions related to NINT's current research initiatives and ongoing analysis of the local, national, and international nanotechnology environments for use in NINT's strategic and financial planning.

- *Nutraceuticals Cluster Initiative* - NRC-IRAP is helping to build an initiative that will link the scientific expertise of NRC-PBI with competitive intelligence capabilities of NRC-CISTI and its own networking, advisory and business development expertise. The initiative will enhance commercial activity, linkages and services to SMEs related to NRC-PBI's Crops for Enhanced Human Health Cluster Initiative.

  Since the fall of 2002, NRC-IRAP and NRC-CISTI, in partnership with nine other federal and provincial agencies in Western Canada has been working on initiatives to support Western Canadian small and medium-sized nutraceutical, functional food and natural health products enterprises. Under the banner of "Wellness West", a memorandum of understanding (MOU) is in the process of being signed and initiatives have included the development of a commercialization roadmap; technology infrastructure database; international outreach strategy (marketing and technology focus); technology newsletter; workshops and seminars;

and the facilitation of Glycemic Index (GI) labelling in Canada, allowing basic GI information to be used on packaging.

- Fuel Cell Cluster Initiative - NRC- CISTI provided scientific and technical information services to NRC-IFCI, to six fuel cell/hydrogen technology development companies located onsite at NRC-IFCI, to the fuel cells Canada industry association, and to Natural Resources Canada.

Attract and retain resources for future sustainability

Enhance collaborative partnerships – In 2005-2006, NRC continued to increase its efforts to engage the involvement and commitment of industry to the cluster activities across Canada through collaborative partnerships. Table 2-3 provides a summary of NRC's ongoing cluster initiatives.

In 2001, NRC received funding to target a number of emerging research and technology fields that were identified by local partners in consultations with NRC. In 2005-2006, an evaluation of these cluster initiatives was launched. The primary reasons for conducting an evaluation of the initiatives were:

- to collect information on the progress of the initiatives to date, including lessons learned and novel practices, as a means of supporting NRC's strategic direction in contributing to the socio-economic sustainability of Canada's communities, through technology clusters;
- to provide an opportunity to communicate with initiative stakeholders in the communities; and
- to provide information on NRC's performance to date, to be used to facilitate decision-making around funding renewal of the cluster initiatives, which expires at the end of a five year funding cycle (2006-2007).

The results of the evaluation will be reported in NRC's 2006-2007 Departmental Performance Report (DPR).

Table 2-3 Allocation of Resources for NRC Technology Cluster Initiative Development

Location	Focus	Resources (millions)
2002-2003 to 2006-2007		
Saguenay-Lac-Saint-Jean, QC	Aluminium technologies	$27.0[1,2]
Ottawa, ON	Photonics	$30.0
Winnipeg, MB	Medical device technologies	$10.0
Saskatoon, SK	Plant Nutraceuticals	$10.0
Edmonton, AB	Nanotechnology	$60.0[3]
Vancouver, BC	Fuel cells	$20.0

Table 2-3 Allocation of Resources for NRC Technology Cluster Initiative Development (continued)

Location	Focus	Resources (millions)
2003-2004 to 2007-2008		
Victoria / Penticton (BC)	Astronomy	$ 20.0
Charlottetown (PEI)	Nutrisciences and health	$ 20.0
Regina (SK)	Sustainable urban infrastructure	$ 10.0
2005-2006 to 2009-2010		
Halifax, NS	Life Sciences (NRC-IMB and NRC-IBD)	$19.5
Fredericton, Moncton and Saint-John, NB	Information Technology	$48.0
St. John's, NF	Ocean Technology	$16.0
Atlantic Canada	Coordination, administration, special studies, innovation assistance, S&T knowledge/information dissemination	$26.5

1: An additional $5 million was received in 2001-2002
2: Canada Economic Development for Quebec Regions (CED) contributed an equal amount
3: The Province of Alberta also contributed $60 million

Priority 4 Program Management for a Sustainable Organization

To perform at the leading edge of R&D and support Canadian industry in becoming more technology intensive and innovation driven requires the best available equipment and facilities and the ability to attract and retain highly qualified scientists, engineers, technicians and other professionals. NRC faces challenges in sustaining these key resources and in 2005-2006 continued to focus on strategies to address them.

Performance Indicators (as identified in the 2005-2006 RPP)	• Human Resources (HR) turnover rates • Sustained investments in priority areas • Evaluation of research management practices • Extent that corporate management framework is used to support/ identify priorities and make management decisions • Extent that NRC Council fulfills its mandated role • Survey with key stakeholders on perception of NRC

Not all performance indicators are reported on annually.

PERFORMANCE HIGHLIGHTS

NRC Renewal: Reposition for the Future

NRC's Renewal Initiative is a key element in addressing the organization's sustainability. It was led by the Vice-President, Renewal and encompassed important changes in the way NRC manages and conducts its business. A key objective of this initiative was to review the value and continuing relevance of NRC's program activities. Key projects in 2005-2006 that supported the NRC Renewal Initiative included:

New corporate strategic direction – Work completed in 2005-2006 to develop NRC's new corporate strategic direction was divided into three phases.

- Phase 1 - Environmental Scanning (March-August 2005). An environmental scan was completed to identify major opportunities and core competencies.

- Phase 2 - Setting Strategic Direction (June-December 2005). The NRC Renewal team conducted 7 cross-country workshops with key external stakeholders from industry, universities, and provincial and municipal government organizations. The objective of these consultations was to build a shared understanding of the S&T opportunities and challenges for Canada and assess the role that can be played by NRC.

- Phase 3 - Strategy Development (January-April 2006). *Science At Work for Canada: A Strategy for the National Research Council, 2006-2011* was launched internally in May 2006. The Strategy represents an important evolution for NRC as Canada's national R&D and innovation organization. It clearly outlines NRC's intentions and how it can continue to meet the needs and expectations of its many clients, partners, and key players in Canada's innovation system. The strategy will be launched externally in fall 2006.

Strategy for integrated corporate management framework – In January 2005, NRC launched its Planning, Performance and Resource Management (PPRM) Project. Details on activities completed in 2005-2006 on this project can be found in Table 3-12

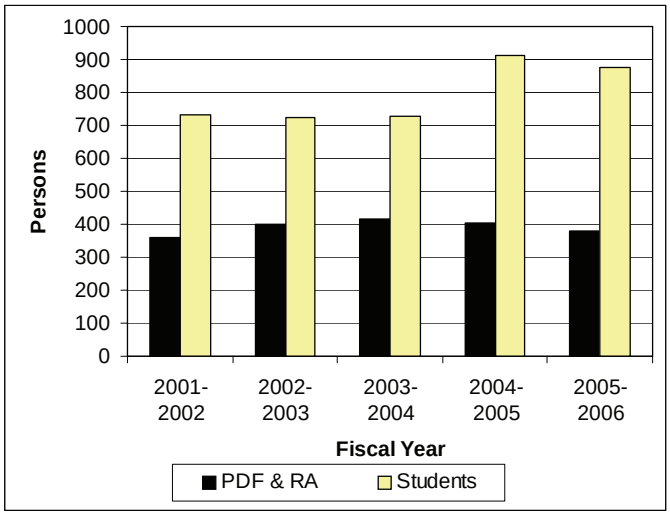
Strategies for sustainable resources – Faced with ongoing resource pressures, NRC is working towards making more strategic choices regarding the use of future resources. This involves a number of initiatives. Progress made on these initiatives in 2005-2006 are summarized below.

- *Address funding issues and the Government Expenditure Review:* As part of the implementation of NRC's new strategy, NRC launched a project referred to as "Sustainable Organization". The project consists of three components: the rationalization of resources in the context of NRC's current financial situation; development of an investment strategy for NRC, taking into account NRC's portfolio management objectives and the priorities set out in the strategy; and the preparation of an investment and marketing plan to secure additional resources for the organization in line with the investment strategy.

- *Recruit, retain and train S&T people:* The development of highly qualified personnel is a priority for supporting an innovative and knowledge-based economy. NRC directly contributes to the development of highly qualified personnel through the training of students and recent graduates.

  NRC recruited 506 employees bringing the total number of NRC staff to 4,208[12]. Over

Figure 2-6: NRC Training Programs (2001-2006)



[12] Salaried employees, as of 31 March 2006.

1,250 students, Post-doctoral Fellows (PDFs) and Research Associates (RAs) worked on research teams at NRC Institutes. These individuals have the opportunity to work in a challenging research environment with leading experts in their fields thereby gaining valuable experience and training. In 2005-2006, 482 graduate students, 393 summer and co-op students, 262 Natural Sciences and Engineering Research Council Visiting PDFs and 118 RAs worked at NRC (see Figure 2-6).

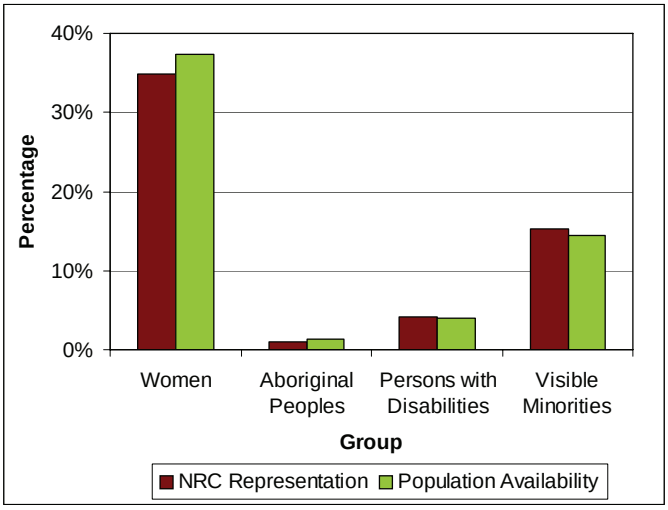
Turnover - Turnover has been relatively consistent for the past three years, with turnover of continuing staff being considerably lower than that of our contingent workforce.

	2005-2006	2004-2005	2003-2004
	(percentage)		
Total Turnover	10.75	11.08	12.05
Total Continuing Turnover	3.16	3.2	2.84

(Total turnover includes end of term and short term positions, i.e., was anticipated.)

Employment Equity - At the corporate level the representation of persons with disabilities and visible minorities surpassed availability, whereas the representation of women and Aboriginal peoples was somewhat lower than anticipated for 2005-2006. Persons with disabilities constituted 4.1% of NRC's workforce on March 31, 2006, compared to 3.9% in 2004-2005. Women constituted 34.8% of all employees in fiscal 2005-2006, compared to 35.2% the previous year. In both years their representation met availability by 96%. Aboriginal peoples constituted 1.0% of the NRC's workforce in 2005-2006, unchanged from the previous year. In both years their representation met availability (1.3%) by 77%. Visible minorities constituted 15.2% of the workforce, unchanged from previous year. They remained equitably represented in the NRC's workforce (see Figure 2-7). NRC has adjusted its employment equity goals (corporate and Institute/Program/Branch level) for the upcoming year to address areas of under-representation.

Figure 2-7: Designated Groups at NRC (2005-2006)



Training - Through internal and external training, conferences and learning opportunities, NRC invests in the development of its workforce. In 2005-2006, $4.6 million was invested in learning, representing 1.7% of salary expenditures. This is consistent with the level of investment in learning in 2004-2005.

Collective Agreements – NRC's Employee Relations (ER) Group is mandated to negotiate and administer collective agreements on behalf of Council and to foster the development and maintenance of effective and productive consultations with Bargaining Agents at the Professional Institute of the Public Service of Canada (PIPSC) and the Research Council

Employees' Association (RCEA). During 2005-2006 a total of ten collective agreements were administered by the ER group. Additionally, Human Resource's Branch (HRB) staff were engaged in seven rounds of negotiations and concluded negotiation on three collective agreements during 2005-2006.

Official Languages (OL) – The number of NRC Executives who meet the linguistic requirements of their positions has increased from 73% in 2004 to 84% in 2005- a true sign of their commitment to meet OL Program goals. Eighty-seven percent of employees meet the linguistic requirements of their positions (of the 13% that do not meet, the majority are currently in language training). NRC's Maintenance of Second Language Skills Campaign continues to generate interest from members of other federal organizations. In 2005-2006, NRC received unsolicited requests to present on its best practices, including to: the Departmental Advisory Committee on Official Languages (April 2005), the Good Practices Forum on Official Languages (November 2005), the Ontario Federal Council (January 2006), as well as the Pacific General Council (February 2006).

Human Resources Management (HRM) Plan – Approved in 2004-2005, the NRC HRM Plan aims to support the achievement of NRC's priorities. NRC's HRM goal is to be recognized as an outstanding employer with outstanding employees distinguished by creativity and innovation. The HRM Plan focuses on the following five broad themes linked to organizational priorities: recruit outstanding people; develop leadership at all levels; build cross-functional cross-cultural capabilities; align compensation and reward practices; and update the Human Resource (HR) performance management framework.

Some highlights of progress in implementing the plan in 2005-2006 are as follows:

- Progress was made on NRC's Modernization of Hiring initiative. This initiative was developed as a joint Management/Human Resources project to streamline the hiring process and to increase the overall effectiveness and efficiency of hiring at NRC. The scope of this project included the review of NRC's hiring practices, tools, policies and guidelines, from pre-selection to appointment. Through a concerted effort to hire well, retain the right resources and provide a challenging and supportive environment, NRC is ensuring the right foundation is established to support its business priorities. The underlying theme of the project's recommendations is that *"people, not process, hire people"*. Advances in achieving the project recommendations in 2005-2006 include: reducing the minimum posting time from 10 to 6 working days; introducing NRC job alert service; and establishing mandatory on-line applications. Additionally, a pilot project was launched to enhance the efficiency of the hiring process by applying project management methodology.

- Continued development and implementation of NRC's Leadership Enrichment and Development (LEAD) Program including Management Orientation, Executive Challenge, Accelerated Leadership Development and Ongoing Leadership Learning. After a rigorous selection process, 17 candidates were selected from more than 70 applicants for LEAD. The participants come from NRC Institutes, Programs, and Branches across Canada and bring diverse expertise in research, business development, management and community partnership. Beginning in April 2006 these participants will work on real-time NRC issues for 18 months and enhance their leadership skills in the process.

- NRC has been an active participant in the Science ADMs Advisory Committee (SAAC), which is revamping its community-wide human resources plan to address the HR needs applicable to all members of the S&T community. All Science Based Departments and Agencies (SBDAs) are experiencing similar challenges with respect to recruitment, retention, workforce planning and learning. By studying these issues collectively, it will allow NRC to take positive steps towards addressing these key HR challenges while moving forward on the overall S&T agenda. As well, NRC has been actively engaged in working on addressing horizontal barriers in HR in order to further strengthen the community's ability to work collaboratively.

- In 2005-2006 significant steps were taken to combine the Management level (MG) Merit Review Process with the MG Performance Planning and Review Process. The resulting process is more closely aligned with the Treasury Board Secretariat (TBS) Management Accountability Framework and the proposed NRC Integrated Planning, Performance and Resource Management (PPRM) process, as well as with other MG HR systems such as recruitment, staffing, development and rewards. Further, the administrative burden with respect to these processes has been lessened. The processes are supported by a new Management Accountability Agreement (MAA), which will take effect in 2006-2007.

- A Human Resources Measurement Program was established. The primary focus of this program is the development, implementation and evaluation of a human resources performance measurement framework which reports on NRC's performance in the area of human resources management and HRB's performance as a human resources management service provider. Through this position, HRB will work with the Strategy and Development Branch in ensuring Human Resources plans are integrated with the Institute/Program/Branch business plans.

Maintain and upgrade NRC S&T infrastructure – In 2005-2006, the NRC Long Term Capital Plan (LTCP) 2006-2010 was prepared through an integrated process in which NRC identified its requirements for investment in current equipment and buildings and new equipment and buildings. The LTCP 2006-2010 provides a comprehensive list of capital assts requirements planned over the next five years. The plan will be submitted to TBS in fall 2006.

During the past year, NRC spent $2.5 million to address the most urgent "rust out" concerns. Projects that related to health and safety concerns were the first priority followed by those that addressed life cycle management issues.

Examples of some projects are completed in 2005-2006:

- Replaced emergency generators in at NRC-IOT and NRC-HIA (Penticton)
- Insulated walls and replaced windows to save energy and prolong the life of buildings
- Replaced inefficient boilers in a number of buildings
- Upgraded electrical systems in a number of buildings
- Asbestos removal
- Upgraded elevator
- Modify HVAC controls in a number of buildings

Develop strategy for effective NRC communications and marketing - In 2005-2006, NRC completed two Public Opinion Research studies that provided increased understanding of

stakeholder awareness of NRC, its brand, reputation, programs and activities. In addition, the studies collected stakeholder requirements for information concerning NRC programs and services of most relevance and interest to them. These studies provided baseline information that was used in the development of several key communications strategies throughout the year.

In 2005-2006, NRC participated in and contributed to the development of several government-wide Communications Strategies including: the Canada-US Enhanced Representation Initiative Strategy; the Communications Strategy to support the Canadian Biotech Strategy; and the S&T Integration Communications Strategy.

Address OAG Recommendations

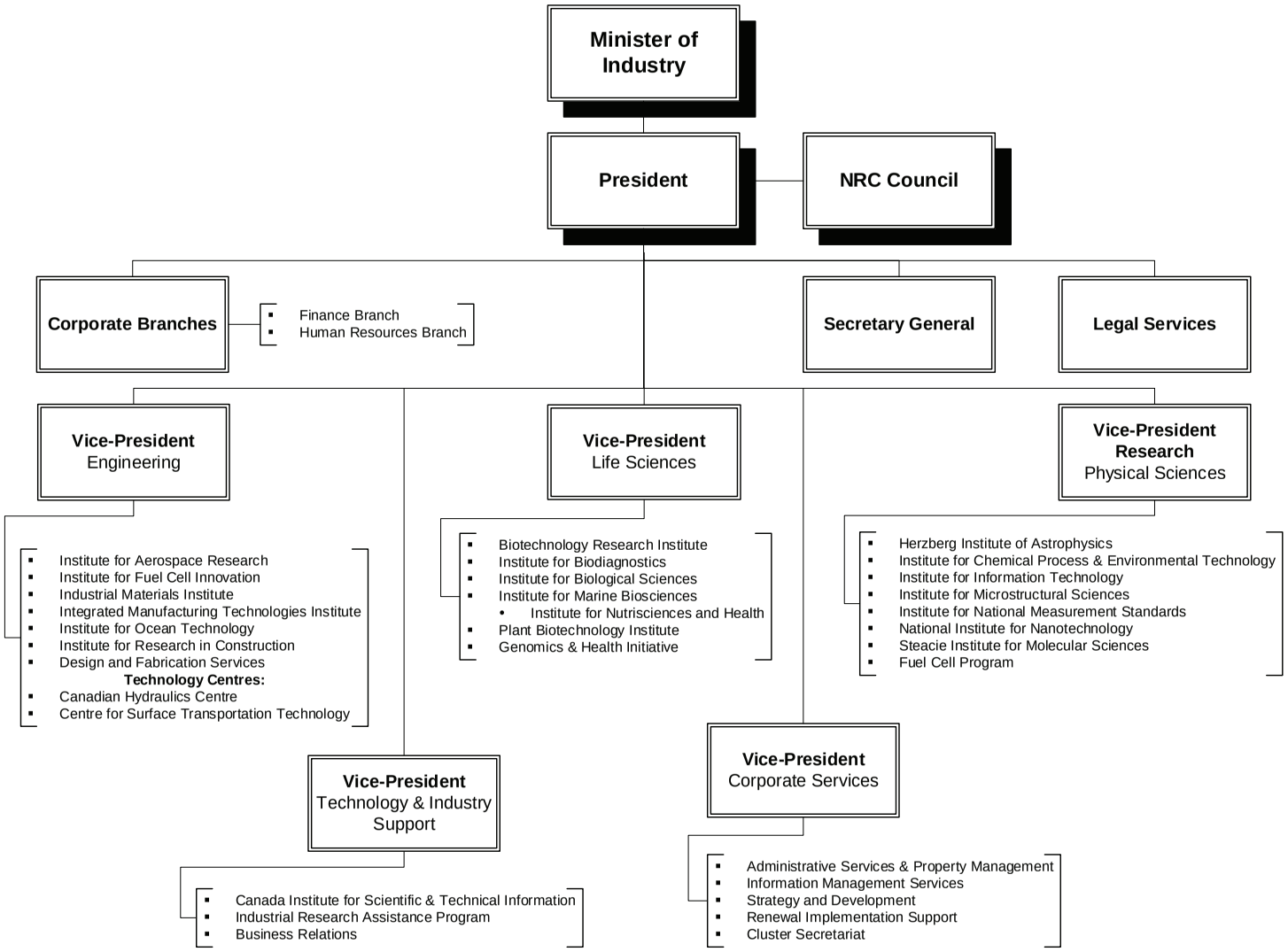
The Office of the Auditor General of Canada (OAG) conducted a Value for Money audit of NRC in 2003-2004. For a summary of NRC's actions in 2005-2006 in response to the OAG's recommendations see Table 3-12.

Section III: Supplementary Information

Organizational Information

NRC reports directly to the Parliament of Canada through the Minister of Industry. NRC works in partnership with the members of the Industry Portfolio to leverage complementary resources and exploit synergies in areas such as growth of SMEs, innovation of firms through S&T and economic growth of Canadian communities. The NRC Council provides strategic direction and advice to the President and reviews organizational performance. The President is the leader, responsible for fulfilling corporate strategies and delivering results. Five Vice-Presidents (Life Sciences, Physical Sciences, Engineering, Technology and Industry Support and Corporate Services) are responsible for a portfolio of research Institutes, Programs, Branches and Centres.

Figure 3-1: NRC's Organizational Chart



Tables

Table 3-1: Comparison of Planned to Actual Spending, incl. FTE (millions of dollars)

Program Activity	2003-04 Actual	2004-05 Actual	2005-2006 Main[1] Estimates	2005-2006 Planned Spending	2005-2006 Total[2] Authorities	2005-2006 Actual
Research and Development	497.4	498.4	438.6	495.3	560.4	**519.1**
Technology and Industry Support	207.9	214.0	203.1	213.1	225.4	**215.8**
Total	**705.3**	**712.4**	**641.7**	**708.4**	**785.8**	**734.9**

Total	**705.3**	**712.4**	**641.7**	**708.4**	**785.8**	**734.9**
Less: Spending of Revenues Pursuant to section 5(1)(e) of the NRC Act	(61.4)	(59.4)	N/A	(71.6)	N/A	(85.2)
Plus: Cost of Services received without charge[3]	20.3	21.1	N/A	19.5	N/A	25.9
Net Cost of Department	**664.2**	**674.1**	**N/A**	**656.3**	**N/A**	**675.6**

Full Time Equivalents (FTE)	**4,140**	**4,178**	**N/A**	**3,886**	**N/A**	**4,155**

Notes

(1) Respendable revenue and employee benefit plans are already in the Main Estimates total.

(2) For the 2005-06 reporting cycle, the "total authorities" column refers to the total spending authorities received during the fiscal year, as well as funding received from the 2005-06 Governor Special Warrants.

(3) Services received without charge include accommodation provided by PWGSC, the employer's share of employees' insurance premiums, Audit Services received from the OAG, Payroll services provided by PWGSC, Workers' Compensation coverage provided by Social Development Canada, and services received from the Department of Justice Canada (see Table 3-4).

Table 3-2: Resources by Program Activity (millions of dollars)

	2005-2006 Budgetary					
Program Activity	**Operating[1]**	**Capital**	**Grants and Contributions**	**Total: Gross Budgetary Expenditures**	**Statutory Items[2]**	**Total**
Research and Development						
Main Estimates	316.2	51.6	30.1	397.9	40.7	438.6
Planned Spending	*337.9*	*66.8*	*50.0*	*454.7*	*40.7*	*495.3*
Total Authorities[3]	355.0	65.2	53.2	473.4	87.0	560.4
Actual Spending	**344.3**	**63.3**	**54.3**	**461.9**	**57.2**	**519.0**
Technology and Industry Support						
Main Estimates	86.3	2.3	83.6	172.2	30.9	203.1
Planned Spending	*91.6*	*2.3*	*88.2*	*182.1*	*30.9*	*213.1*
Total Authorities[3]	96.7	2.3	87.6	186.6	38.8	225.4
Actual Spending	**101.4**	**2.2**	**84.2**	**187.8**	**28.0**	**215.9**
Total						
Main Estimates	402.5	53.9	113.7	570.1	71.6	641.7
Planned Spending	*429.5*	*69.1*	*138.2*	*636.8*	*71.6*	*708.4*
Total Authorities[3]	451.7	67.5	140.8	660.0	125.8	785.8
Actual Spending	**445.7**	**65.5**	**138.5**	**649.7**	**85.2**	**734.9**

Notes

(1) Operating includes contributions to employee benefit plans.
(2) Spending of revenues pursuant to the NRC Act.
(3) For the 2005-06 reporting cycle, the "total authorities" line refers to total spending authorities received during the fiscal year, as well as funding received from 2005-06 Governor General Special Warrants.

Table 3-3: Voted and Statutory Items (millions of dollars)

Vote or Statutory Item	Truncated Vote or Statutory Wording	2005-2006 Main Estimates	Planned Spending	Total Authorities[(1)]	Total Actuals
	National Research Council Program				
55	Operating expenditures	356.4	381.4	394.3	**388.1**
60	Capital expenditures	53.9	69.2	67.5	**65.6**
65	Grants and contributions	113.8	138.2	140.8	**138.6**
(S)	Spending of revenues pursuant to the National Research Council Act	71.6	71.6	125.8	**85.2**
(S)	Contributions to employee benefit plans	45.9	48.0	56.6	**56.6**
(S)	Spending of proceeds from Disposal of Crown Assets			0.7	**0.7**
(S)	Collection Agency Fees			0.1	**0.1**
	Total	**641.6**	**708.4**	**785.8**	**734.9**

Notes

(1) For the 2005-06 reporting cycle, the "Total Authorities" column refers to total spending authorities received during the fiscal year, as well as funding received from 2005-06 Governor General Special Warrants.

Table 3-4: Services Received Without Charge (millions of dollars)

	2005-2006
Contributions covering employers' share of employees' insurance premiums and expenditures paid by TBS (excluding revolving funds)	24.5
Salary and associated expenditures of legal services provided by Justice Canada	0.4
Worker's compensation coverage provided by Social Development Canada	0.3
Accommodation provided by Public Works and Government Services Canada	0.2
Payroll Services provided by Public Works and Government Services Canada (PWGSC)	0.2
Audit Services provided by the Office of the Auditor General (OAG)	0.4
Total 2005-2006 Services received without charge	**25.9**

Table 3-5: Sources of Respendable Revenue (millions of dollars)

Program Activity	Actual 2003-04	Actual 2004-05	2005-2006 Main Estimates	2005-2006 Planned Revenue	2005-2006 Total Authorities	2005-2006 Actual
Research and Development						
Fee for Service	34.2	29.6	24.1	24.1	38.7	**38.7**
Rentals	2.5	2.8	2.5	2.5	3.1	**3.1**
Royalties	5.3	4.9	5.2	5.2	6.3	**6.3**
Publications	1.0	1.8	5.7	5.7	3.0	**3.0**
Other	4.5	5.2	3.1	3.1	3.1	**3.1**
Revenues Available for Use from Prior Years					32.8	
Technology and Industry Support						
Fee for Service	7.2	6.7	5.8	5.8	6.1	**6.1**
Rentals	0.1	0.2	0.2	0.2	0.1	**0.1**
Royalties	-	-	0.1	0.1	-	**-**
Publications	23.4	22.4	24.4	24.4	21.3	**21.3**
Other	1.2	1.7	0.5	0.5	1.6	**1.6**
Revenues Available for Use from Prior Years					9.7	
Total Respendable Revenues	**79.5**	**75.2**	**71.6**	**71.6**	**125.8**	**83.3**

Notes
In accordance with section 5.1 (e) of the National Research Council Act, NRC is authorized to spend its operating revenues and therefore does not net-vote.

Table 3-6: Resources Requirements by Branch or Sector (millions of dollars)			
2005-2006			
Organization	**Research and Development**	**Technology and Industry Support**	**Total**
Research Institutes			
Main Estimates	438.6		438.6
Planned Spending	*495.3*		*495.3*
Total Authorities	560.4		560.4
Actuals	**519.1**		**519.1**
Industrial Research Assistance Program			
Main Estimates		150.8	150.8
Planned Spending		*158.2*	*158.2*
Total Authorities		167.3	167.3
Actuals		**160.2**	**160.2**
Scientific and Technical Information			
Main Estimates		46.5	46.5
Planned Spending		*48.8*	*48.8*
Total Authorities		51.6	51.6
Actuals		**49.4**	**49.4**
Technology Centres			
Main Estimates		5.8	5.8
Planned Spending		*6.1*	*6.1*
Total Authorities		6.5	6.5
Actuals		**6.2**	**6.2**
TOTAL			
Main Estimates	438.6	203.1	641.7
Planned Spending	*495.3*	*213.1*	*708.4*
Total Authorities	560.4	225.4	785.8
Actuals	**519.1**	**215.8**	**734.9**

Table 3-7: User Fees/External Fees

				2005-2006					Planning Years		
A. User Fee	**Fee Type**	**Fee Setting Authority**	**Date Last Modified**	**Forecast Revenue**	**Actual Revenue**	**Full Cost**	**Performance Standard[1]**	**Performance Results[1]**	**Fiscal Year**	**Forecast Revenue**	**Estimated Full Cost**
Fees charged for the processing of access requests filed under the *Access to Information Act (ATIA)*	Other products and services (O)	*Access to Information Act*	1992	$700	$780	$83,328 This cost includes the salary of the ATIA Coordinator and a small percentage of other salaries related to administrative services	Response provided within 30 days following receipt of request; the response time may be extended pursuant to section 9 of the *ATIA*. Notice of extension to be sent within 30 days after receipt of request. The *Access to Information Act* provides fuller details: http://laws.justice.gc.ca/en/A-1/218072.html.	NRC responded to 86 access to information requests; 32 consultations from other government departments. NRC routinely waives fees in accordance with TBS guidelines	2006-2007	$750	$160,000
									2007-2008	$750	$160,000
									2008-2009	$750	$160,000
			Total	$700	$780	0		Total			$480,000

B. Date Last Modified: N/A

C. Other Information: National Research Council collects user fees for information requests in accordance to the *Access to Information Act*. The total user fees collected in 2005-2006 included application, preparation and search fees.

[1] Note: According to prevailing legal opinion, where the corresponding fee introduction or most recent modification occurred prior to March 31, 2004:

- the performance standard, if provided, may not have received parliamentary review; and
- the performance standards, if provided, may not respect all establishment requirements under the UFA (e.g., international comparison; independent complaint address).
- the performance result, if provided, is not legally bound to section 5.1 of the UFA regarding fee reductions for unachieved performance.

Table 3-8: Policy on Service Standards for External Fees

In November 2004, Treasury Board ministers approved the *Policy on Service Standards for External Fees*. The Policy requires departments to report on the establishment of service standards for all external fees charged on a non-contractual basis. In NRC's context, this policy applies to the following programs: NRC-CISTI Document Delivery, NRC-IRC Publication Sales and the Certified Reference Materials Program jointed operated by NRC-INMS and NRC-IMB and fees charged for the processing of access requests filed under the *Access to Information Act (ATIA)*.

Progress Made in 2005-2006: In May 2005 the Vice-President, Technology and Industry Support was appointed to oversee implementation of the *Policy on Service Standards for External Fees* (PSSEF) at NRC.

Starting in September 2005, an NRC working group was convened in anticipation of implementing the PSSEF policy in April 2006.

The working group established the common parameters for implementing the PSSEF. These include:

- Common declaration of quality service – This includes the principles describing the quality of service delivery clients should expect for external fee-related activities. This common declaration, which appears on each Institute's website, include: accessible, dependable and timely; clear and open; fair and respectful; and responsive and committed to improvement.
- Service delivery targets – Institutes established delivery targets for key aspects of their document delivery/services (e.g., orders processed and shipped within 3 business days, delivery time within 5 days);
- Client feedback mechanism – All Institutes identified how they will provide the opportunity for clients to give feedback. Examples include a comment card on the Institute website or a client help desk;
- Tracking performance – Institutes identified how they will track the data needed (e.g., date order received and shipment date) to report against their service delivery targets, as well as how they will capture client comments received.
- NRC PSSEF reporting in annual Departmental Performance Report (DPR) - Starting in 2006-2007, service delivery targets and client feedback and follow-up for Institutes will appear in NRC's DPR.

In 2005-2006, only NRC CISTI Document Delivery collected information against this policy.

A. External Fee	Service Standard		2005-2006 Performance Result	Stakeholder Consultation
Fees charged for NRC-CISTI Document Delivery	Direct – ordered electronically and delivered by Ariel or fax	Process ordered within 24 hours*	Standard exceeded. We delivered 91% of all direct orders within 24 hours	Not available
	Direct - ordered and/or delivered non-electronically			
	Direct - ordered electronically and delivered by Secure Desktop Delivery			
	Global – copies and loans	Receive article they are seeking	95% of Global orders were filled	Not available
	Urgent	Receive a response to orders within 2 hours	99% of clients received answer within 2 hours either as a document filled or not available	Not available

A. External Fee	Service Standard		2005-2006 Performance Result	Stakeholder Consultation
	Client Contacts	Client Satisfaction: less than 3% of orders processed result in client Help Desk contacts	1.9% (Standard exceeded)	Not available
Fees charged for the processing of access requests filed under the *Access to Information Act (ATIA)*	Response provided within 30 days following receipt of request; the response time may be extended pursuant to section 9 of the *ATIA.* Notice of extension to be sent within 30 days after receipt of request. The *Access to Information Act* provides fuller details: http://laws.justice.gc.ca/en/A-1/218072.html.		NRC did its utmost to respond to the access to information requests in a timely, accurate and efficient manner. Sixty-five percent of the requests were processed within 30 days, 17% were the object of an extension sent within 30 days after receipt of the request, 18 % of the access requests were processed after the 30 legislated days.	The service standard is established by the *Access to Information Act* and the Access to Information Regulations. Consultations with stakeholders were undertaken by the Department of Justice and the Treasury Board Secretariat for amendments done in 1986 and 1992.

* 90% of all direct orders are filled within 24 hours

Table 3-9: Details on Project Spending (millions of dollars)

Program Activity	Current Estimated Total Cost	Actual 2003-04	Actual 2004-05	2005-2006 Total Main Estimates	2005-2006 Total Planned Spending	2005-2006 Total Authorities	2005-2006 Actual
Research and Development							
Advanced Aerospace Manufacturing Technology Centre, Project Close-out Phase, (S-EPA)	34.1	12.1	4.9	-	-	0.4	**0.4**
Aluminium Technology Centre, Project Close-out Phase, (S-EPA)	34.4	7.4	5.0	2.5	2.5	2.5	**2.5**
Construction of the Canadian Photonics Fabrication Centre, Project Close-out Phase, (S-EPA)	19.0	7.6	2.2	0.0	0.0	1.1	**1.1**
Construction of an Industrial Partnership Facility (IPF) adjacent to NRC-IBD, Project Close-out Phase, (S-EPA)	8.5	0.9	6.7	1.0	1.0	1.7	**1.7**
Move of the National Research Council's Innovation Centre, Project Implementation Phase, (S-EPA)	20.0	1.0	3.1	16.1	16.1	13.1	**13.1**
Construction of Industry Partnership Facility (IPF) at NRC-IMB, Project Close-out Phase, (DA)	7.2	3.4	0.9	0.0	0.0	0.5	**0.5**
Lease Project Approval for the National Institute for Nanotechnology – Project Completion Phase (S-LPA)	87.2	0.0	0.0	7.0	7.0		**5.4**
Lease Project Approval for the Institute for Nutrisciences and Health Project Implementation Phase (I-LPA)	2.1	0.0	0.0	1.5	1.5	0.0	**0.0**

Table 3-10: Details on Transfer Payments Programs (grants, contributions and other transfer payments)

NRC manages the following transfer payment programs:

- Industrial Research Assistance Program (NRC-IRAP)
- Tri-University Meson Facility (TRIUMF)
- Canada-France-Hawaii Telescope (CFHT), James Clerk Maxwell Telescope (JCMT), Gemini Telescopes

Supplementary information on Transfer Payment Programs can be found at http://www.tbs-sct.gc.ca/est-pre/estimate.asp.

Table 3-11: NRC's Financial Statements

FINANCIAL STATEMENT DISCUSSION AND ANALYSIS

The following financial statement discussion and analysis (FSD&A) should be read in conjunction with the audited financial statements and accompanying notes of the National Research Council of Canada (NRC) for the fiscal year ended March 31, 2006. These financial statements have been prepared in accordance with Treasury Board accounting policies and year-end instructions issued by the Office of the Comptroller General which are consistent with Canadian generally accepted accounting principles (GAAP) for the Public Sector. The FSD&A has been prepared following the Public Sector Statement of Recommended Practice SORP-1.

Responsibility for the preparation of the FSD&A rests with the management of the NRC. This FSD&A is limited to discussion of the current financial results of the NRC for 2005-06. Additional performance information will be available in the NRC Departmental Performance Report for 2005-06.

The FSD&A consists of three parts: Highlights, Financial Risk and Uncertainty, and Financial Analysis. All financial information presented herein is denominated in Canadian dollars, unless otherwise indicated.

Special Note Regarding Forward Looking Statements

The words "estimate", "will", "intend", "should", "anticipate" and similar expressions are intended to identify forward looking statements. These statements reflect assumptions and expectations of NRC, based on its experience and perceptions of trends and current conditions. Although NRC believes the expectations reflected in such forward-looking statements are reasonable, they may prove to be inaccurate and consequently NRC's actual results could differ materially from our expectations set out in this FSD&A. In particular, the risk factors described in the "Financial Risk and Uncertainty" section of this report could cause actual results or events to differ materially from those contemplated in forward-looking statements.

HIGHLIGHTS

Audit

Over the last number of years, the Government of Canada has been carrying out a government-wide project to improve the quality of financial management and internal control, an initiative embraced by NRC. An important part of this project is improving the effectiveness of financial management practices and applying the accrual method of accounting to prepare financial statements. This requires dual accounting, as the NRC is still required to use the modified cash method to report on some financial results to the Government of Canada.

In order to ensure that it was on track with this initiative, NRC undertook to have its financial statements for 2005-06 audited by the Office of the Auditor General, in accordance with Canadian generally accepted accounting principles (GAAP) for the Public Sector and Treasury Board accounting policy. NRC is very proud to state that it is being used as a model for other government departments in their transition to audited financial statements.

NRC Renewal

The NRC Renewal Initiative was launched in January 2005 with the purpose of renewing the current Vision (which expires in 2006) and developing a new strategy for NRC that could guide the organization successfully over the next 5 years to 10 years. This project consisted of three phases, all of which occurred to some extent in 2005-06. Phase 1 which began in February 2005 until August 2005, identified NRC's internal competencies, as well as its external opportunities. Phase 2 which occurred from June 2005 to December 2005 defined key strategic directions for NRC in light of its competencies and external environment. The final phase, which began in January 2006, comprised of the development of the actual business strategy. This strategy – Science at Work for Canada – was approved by the NRC Council in March 2006.

Governance

In keeping with the broad government goal of improved management in the public sector, and as a result of its own internal Renewal project to define the NRC Business Strategy for 2006-2010, NRC has implemented a number of initiatives to improve its governance. These initiatives started with implementing changes to the NRC Council and included a redefinition of the role of the NRC Council, revised terms of reference for Council's Executive Committee and proposed terms of reference for three new standing committees. One of these committees' mandate relates to Audit, Evaluation and Risk Management; another deals with Human Resources and the third committee is mandated in the area of NRC Planning and Priorities. The first two committees have been put into place.

As part of the NRC Renewal initiative, NRC Senior Executive Committee (SEC) established a Strategy and Priorities Committee (SPC). The committee reports to SEC and served as the steering committee for Renewal. It will continue to stand and provide senior management with ongoing advice on NRC priorities and strategic direction.

A significant change in how NRC manages its research institutes and programs was implemented with the introduction of portfolio management. Under this new structure, the Vice Presidents have a greater role in setting the strategic direction of the institutes and allocating resources to these priorities. Once fully implemented, portfolio management will improve NRC's ability to undertake and manage cross institute projects, as well as ensure that research is well aligned with NRC's corporate vision and strategic priorities.

NRC adopted the financial management model proposed by the Office of the Comptroller General which holds a Chief Financial Officer (CFO) accountable to both the Comptroller General and the department head for financial management in the organization. At NRC the position reports directly to the President and is a key player on NRC's Senior Executive Committee. In support of the CFO model, NRC began measures in 2005-06 to centralize the finance function, place financial advisors in each Vice President portfolio and require sign off of financial information by each responsible manager. Full implementation of these changes should occur in 2006-07 and will result in even greater accountability at all levels in the organization for sound financial management.

In addition to changes in the finance structure, in 2005-06 NRC implemented a much more rigorous cycle for the planning and review of spending and revenue. It also implemented a Budget Advisory Committee to analyze and make recommendations to Senior Executive Committee on financial issues. It also began work on an integrated planning and performance cycle to ensure that business plans at the institute program level align with NRC's priorities and that program results are measured against these priorities.

Another significant initiative undertaken in 2005-06 was the introduction of a Risk Management Framework for NRC. This framework identified the major risk areas for NRC and the strategies required to minimize this risk. The methodology which supports risk management was introduced to the institutes on a pilot basis, and risk analysis will be integrated into the NRC business planning cycle in the future.

Revenue

Revenue is important to NRC, not only as a means of financing its operating and capital expenditures, but also because it provides an indication of the value that NRC provides to its clients and collaborators.

NRC earns revenue from several sources. Royalty revenue is earned from licensing the rights to use NRC technology. Royalties are typically based on a percentage of the licensee's sales. In 2005-06 NRC generated $5.8 million in royalties. Of this total, $3.8 million was earned from NRC's Institute for Biological Science, primarily for the license of the Meningitis C vaccine.

Facilitating access to NRC researchers and facilities is an important part of technology transfer at NRC. To this end, NRC provides laboratory space to companies on a commercial basis, often as part of a collaboration or technology transfer agreement. Revenue from lease and use of property amounted to $3.1 million in 2005-06.

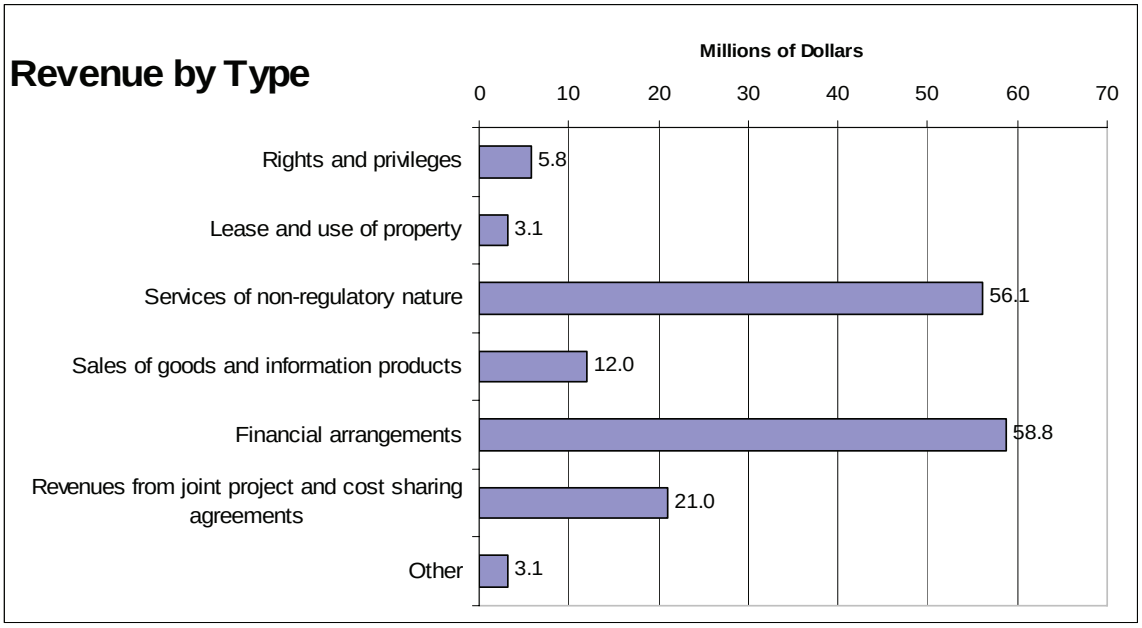
In 2005-06, 35% of NRC revenue ($56.1 million) was generated from the provision of research services directly to industry and academic clients. In 2005-06, NRC's Institute for Aerospace Research (IAR) and Canadian Institute for Scientific and Technical Information (CISTI) accounted for over half of NRC's service revenue.

As part of its goal to disseminate scientific and technical information of importance to industry, NRC has publications and certified reference materials that it sells to clients. Total sales of goods and information products were $12.0 million in 2005-06. Part of this revenue was related to the release of the 2005 editions of the Model National Construction Codes. In order to facilitate the online purchasing of these documents, NRC developed an internet sales capability. From the release of the codes to March 31, 2006, approximately $2.6 million in Code documents were ordered, with approximately 44% of the transactions taking place via the NRC Virtual Store. It is estimated that the use of the internet to process Codes sales has resulted in savings of approximately $125 thousand for NRC from September 2005 to March 2006. In addition, significant savings in the average order processing time resulted from a thorough review and improved coordination of processing procedures while developing the NRC Virtual Store.

NRC undertakes research on behalf of the other Government Departments, called Financial

Arrangements, and is reimbursed the incremental costs associated with this work. In 2005-06, significant work with other Government Departments was undertaken totaling $58.8 million. Most of this work was with the Department of National Defence ($25.2 million) and Natural Resources Canada ($7.3 million). Also included in the Financial Arrangement revenue is $18.8 million from Industry Canada through Technology Partnerships Canada. This amount was received by NRC as part of a repayable contribution program and was used to provide contributions to firms ($16.2 million) and cover operating costs associated with the program ($2.6 million).

NRC also receives income through collaborative research projects which are cost sharing arrangements that focus on work likely to lead to new expertise or technology. Collaborative funding was earned across sectors at NRC for a total of $21.0 million.
The breakdown of NRC revenue by type is as follows:



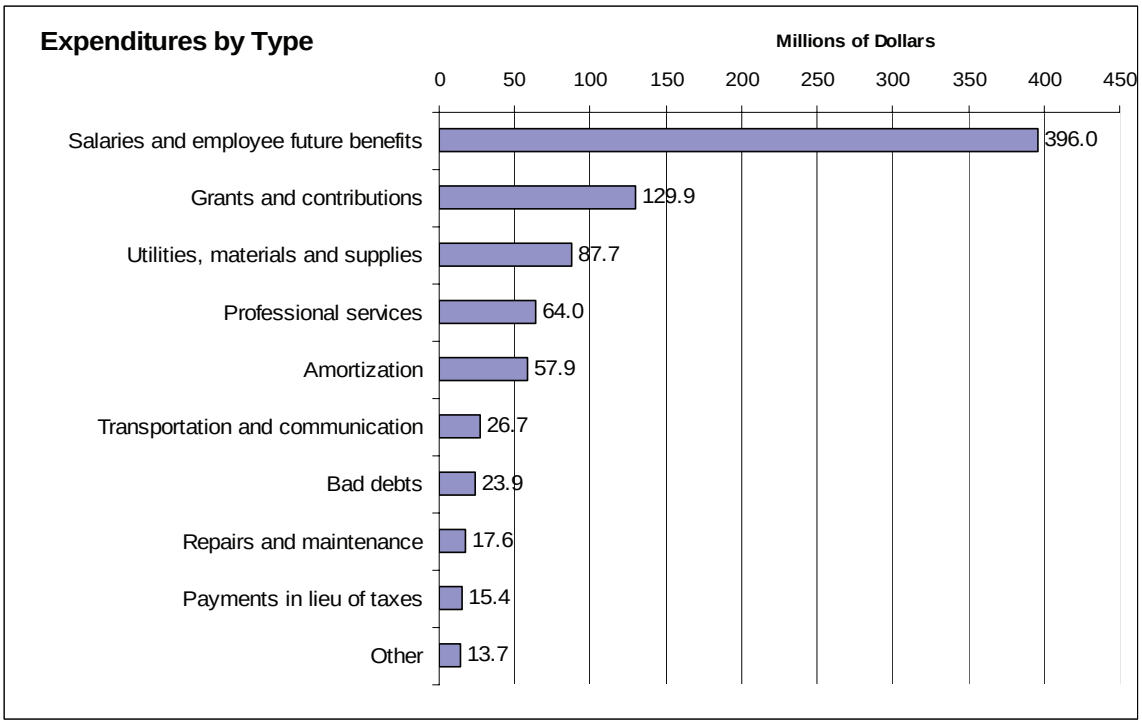
Expenses

NRC's expenses in 2005-06 were $832.8 million, with approximately 47.5% of this representing salary and benefits costs. Grants and contributions costs totaled $129.9 million, with most of this funding going to small and medium sized enterprises through NRC's Industrial Research Assistance Program (IRAP).

Of particular note in 2005-06 is NRC's bad debt expense of $23.9 million. This is primarily due to the review of the IRAP Technology Partnership Repayable Contribution Program that was undertaken in 2005-06. This program provided conditionally repayable contributions to small and medium sized enterprises (SMEs) to support the pre-commercialization phase of their technology development. The program funded up to 33% of the expected total project costs with the firm required to finance the balance. Firms were required to conditionally repay these contributions based on their revenues, meaning that for example, if a firm did not earn any revenue, no repayments were required. This program was targeted to SMEs, many of which were start ups

with one technology. Failure to bring the technology to market due to technical or business challenges resulted, at times, in the firms ceasing operations and thus defaulting on their repayment obligations. Further details can be found in the Financial Analysis Section under Accounts Receivable.

The significant categories of expenses for 2005-06 are as follows:



FINANCIAL RISK AND UNCERTAINTY

NRC expects to face significant budget constraints over the coming years, from both internal and external pressures.

As a Federal Government Departmental Corporation, NRC funds the majority of its salary, operating and capital expenditures (78% in 2005-06) from allotments from the government. The non salary portion of this funding is fixed with no indexing for price increases. As a result, the actual funding for NRC, in terms of buying power, has been declining over the past decade. In particular, the increase in cost related to property taxes and utilities is significant for NRC.

NRC owns and manages 186 specialized buildings that comprise approximately 525,958 square meters of space. It also has an equipment and informatics base of approximately $202.6 million, net book value. NRC's capability to fund the upgrade or replacement of these assets from its appropriations is limited, and it will need to secure sources external to NRC for this purpose.

In the last 2 years, the federal government announced a series of budget reductions across federal departments as part of its realignment strategy and initiative to increase its efficiency. The impact

on NRC was significant and challenging. Further, in the 2006 federal budget, an additional program review exercise was announced by the government. The actual impact on NRC is not yet known.

To help position itself to meet these challenges, NRC implemented changes in 2005-06 in its governance structure and made significant progress towards the development of a new, focused Business Strategy (as detailed in the section Highlights previously). Both of these initiatives will improve the planning, allocation and monitoring of resources, which will in turn help alleviate some of the financial pressures currently being felt by NRC.

In addition, NRC has commenced a thorough resource allocation review to ensure research in priority areas defined in its Strategy is appropriately funded in the future. Also, significant efforts, that engage the Minister of Industry and Central agencies, have begun which are aimed at finding ways to address the external budget pressures.

Details of other factors influencing NRC's budget pressures and uncertainty are provided below.

Sunsetting Funding

In order to ensure value for money, it has been the practice of Treasury Board over the last number of years to provide funding for new initiatives on a sunsetting basis. This means that a permanent increase in the NRC allotment from the government is not provided, but rather funding is provided on a five year basis, with the option for renewal. Renewal is conditional on performance and availability of funding. While this is recognized as a good management practice for the government in the whole, it does create some level of uncertainty and instability in a research organization such as the NRC.

Although funding is not necessarily provided on an ongoing basis, new, government-approved initiatives, such as the establishment of technology cluster sites in centres across Canada, often entail an ongoing commitment from NRC in terms of the construction and maintenance of new, specialized facilities, and the hiring of staff. There is also an expectation by the communities which support, and in some cases invest in, these new initiatives that they will exist beyond the five year funding window. NRC must always be aware in its planning that funding might not be renewed, and that it may have to support these initiatives from its limited fixed allotments.

Foreign Currency

NRC purchases roughly $50 million per year in currencies other than the Canadian dollar, which exposes NRC to fluctuations in foreign exchange. The majority of foreign purchases (86% average over last three years) are transacted in U.S. dollars. Due to the strengthening Canadian dollar over the last year, NRC benefited from an increase in our purchasing power over 2003-04 levels of approximately $4 million U.S. Continued upswing of the Canadian dollar will benefit NRC, whereas a future decline in the Canadian Dollar relative to the U.S. dollar will have the effect of decreasing NRC's purchasing power.

The 2005-06 gain in purchasing power was somewhat negated by the reduction in Canadian dollars received from foreign sales. In 2005-06, NRC received $31.7 million Cdn on sales of $26.6

million U.S. By way of comparison, in 2003-04, NRC received $35.9 million Cdn from $26.5 million U.S. in sales.

NRC does not use any financial instruments to hedge foreign currency fluctuations.

Dependence on Revenue

NRC's dependence on external sources of funding has been growing since the early 1990's. The portion of NRC's operating and capital expenditures funded from external sources of income was roughly 11% in 1991-92. By 2005-06, this percentage had climbed to over 22%.

In particular, NRC has Centres that rely on external sources of revenue to fund the majority of their operations, namely the NRC-Centre for Surface Transportation and the NRC-Canadian Hydraulics Centre. In addition, NRC's two largest institutes – the NRC-Institute for Aerospace Research, and the NRC-Canada Institute for Scientific and Technical Information (with expenditures in 2005-06 of $46.2 million and $48.1 million respectively) rely on external sources of revenue to fund almost half of their operations. Significant downturns in the industries or federal departments that these groups support will greatly impact NRC's ability to continue operations at current levels.

Finally, it is important to note that NRC must strike a fine balance between providing contract research services that generate the needed revenue, and performing the government funded research that keeps NRC at the leading edge. Too much emphasis on revenue generating contract research could compromise NRC's advanced knowledge and technology base, which in the long term will reduce NRC's ability to serve industry and respond to the needs of the nation in critical fields such as energy, the environment, chronic diseases and other priority fields outlined in the Strategy.

FINANCIAL ANALYSIS

In order to comply with generally accepted accounting principles for the Public Sector, NRC changed the way it recorded certain financial information in 2005-06. To ensure continuity, closing balances on the balance sheet as at March 31, 2005 were restated to reflect these changes. Details of the significant changes, as well as other general information can be found below.

Due from Consolidated Revenue Fund

This amount represents an amount of cash that the NRC is entitled to draw from the Federal Government treasury. This amount consists of cash to discharge its liabilities for which NRC has already received an appropriation, as well as revenue received but not spent. In previous years, this amount was not recorded in NRC's financial statements. It was established in 2005-06 and March 31, 2005 was restated to reflect this new policy.

The change in this account between 2005 and 2006 of $11.1 million is due to the increase in accrued liabilities and deferred revenue offset by a decrease in revenue carryforward.

Accounts Receivable

IRAP / TPC

The Industrial Research Assistance Program (IRAP) of NRC has delivered the IRAP-TPC Program since 1998 on behalf of Technology Partnerships Canada (TPC), a special operating agency of Industry Canada. This program provides conditionally repayable contributions to SMEs to support the pre-commercialization phase of their technology development. This conditional repayment program in most cases required quarterly repayments of the contribution based on a percentage of the recipient's gross revenue. This program terminated March 31, 2006 although it will continue to fund, and require repayment from existing agreements during the wind down phase.

It is important to note that this program supported small start-up firms, whose future success was often entirely dependent on one technology. Failure to bring the technology to market, at times, resulted in the firm ceasing operations. However, even with the high risk nature of this program, to date NRC has received repayments amounting to approximately 17% of contributions disbursed; and with over 300 projects still being administered, this percentage is expected to increase over the next decade.

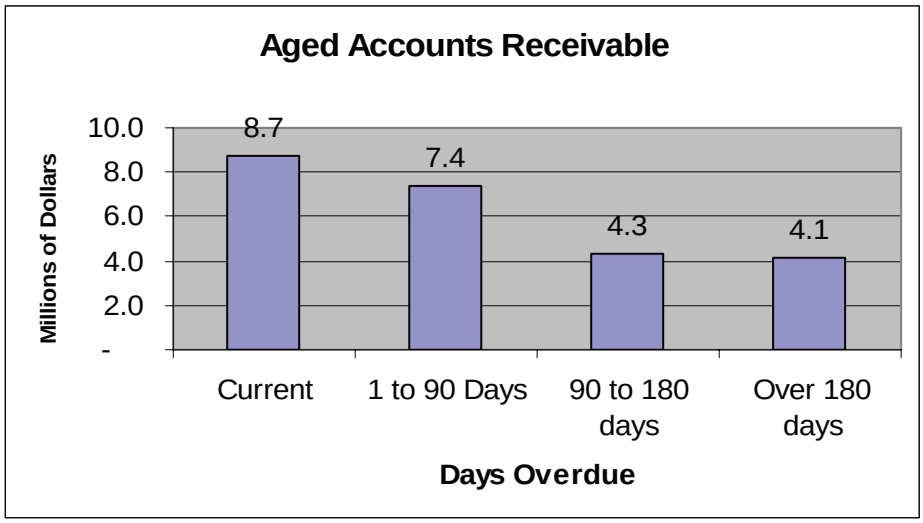
During fiscal year 2005-06, NRC undertook a major initiative to follow-up all active contribution agreements in order to determine whether the repayment phase conditions had been met. As a result of this exercise, $35.6 million in invoices were issued for repayment in 2005-06. An amount of $17.6 million was written-off as uncollectible. An amount of $11.4 million was received from firms, and forwarded back to Industry Canada. As at March 31, 2006, there was a balance of $7.6 million in accounts receivable with respect to this program with a corresponding allowance for doubtful accounts at $6.7 million.

Such a substantial IRAP-TPC write-off is expected to be a one time occurrence as this amount represents the value of the debt relating to firms that had ceased operations over the last few years.

Trade Receivables and IRAP Audit Recoveries

NRC had accounts receivables with external clients worth $22.2 million on its books as at March 31, 2006 with a corresponding allowance for doubtful accounts equal to $2.0 million. This amount represents receivables for work done with external clients as well as receivables for audit findings for IRAP. The amount at March 31, 2006 is a reduction over the previous year primarily due to the collection of several large accounts. Write offs in 2005-06 were $637 thousand which is quite low given the value of NRC revenue.

The aging of the accounts receivable as at March 31, 2006 (including TPC and excluding other government departments and accrued receivables) is as follows:



Inventory for Resale

NRC produces a number of products that are purchased by external clients, namely the Model National Construction Codes, Monographs and Certified Reference Materials. Historically the costs incurred to produce these products were expensed as incurred and therefore no inventory values were established for quantities on hand. In 2005-06, the method of accounting for inventory for resale was changed and the opening and closing inventory balances were adjusted to reflect a value equal to the lower of cost or market. Cost of Sales was also amended to be recorded at the cost value.

Inventory for resale went up by approximately $255 thousand over 2005 closing values due to the addition of the 2005 Model National Construction Codes, as well as new Certified Reference Materials.

Capital Asset Held for Sale

NRC currently occupies a building on leased land on the campus of the University of British Columbia (UBC) in Vancouver. At the request of UBC, NRC agreed to construct a new building on the campus and relinquish the existing building and land lease for $15.0 million. As there is a signed agreement relating to the sale of this building, the building is being reflected as a financial asset.

Equity Investments

As part of its mandate to promote industrial innovation in Canada, NRC provides financial assistance to firms through access to equipment, intellectual property and incubation space in laboratories and in the organization's Industry Partnership Facilities.

Since these companies are very often in their infancy and cannot afford to pay the full cost of the assistance received from NRC, NRC on occasion takes an equity position in the company in return for the assistance provided. This helps the firms survive the critical technology development stage. In turn, it allows NRC to earn a return that somewhat reflects the risk taken, should the company

become successful.

In prior years, NRC investments in public and private corporations were not reflected in the financial statements. In 2005-06, NRC recorded these investments at the lower of cost or fair value. The full value on the balance sheet reflects NRC's investment in publicly traded companies as our shares in privately held corporations are deemed to have no market value. Details of NRC's investment in public companies are as follows:

Company Name	Number of Shares	Amount Recorded in Financial Statement	Market Value at March 31, 2006
JDS Uniphase	171,334	$409,488	$827,543
PharmaGap Inc.	1,305,425	$392,933	$391,628
Chemaphor Inc.	1,260,305	$252,061	$346,584
ACE Aviation Holdings Inc.	33	$743	$1,123
Energy Ventures Inc.	200,000	$1	
Lions Petroleum Inc.	1,050	$1	$810
Total		$1,055,227	$1,567,687

The increase in equity investments from 2005 to 2006 is attributable to the conversion of the shares held by NRC in the private firm Occell Inc. to publicly traded shares in Chemaphor Inc. due to an amalgamation.

Subsequent event – Disposal of JDS Uniphase shares

On May 25, 2006, the Council completed a transaction whereby it disposed of all of it's JDS Uniphase Canada Ltd marketable securities; it sold 171,334 shares at their market value of $3.2597 per share for a total of $551 thousand (net of commission of $7.4 thousand) resulting in a net gain of approximately $142 thousand.

Holmes Endowment Fund

The Holmes Endowment Fund is an investment bequeathed to NRC in July 1994. Up to two thirds of the endowment fund's yearly net income is used to finance the H.L. Holmes award on an annual basis. The award provides the opportunity to post-doctoral students to study at world famous graduate schools or research institutes under outstanding researchers.

In 2005-06, the Holmes Endowment Fund Investment was restated to reflect amortized cost of the bonds held in the fund. It had previously been carried at the fair market value of the investments.

Prepaid Expenses

Subscriptions

NRC changed the way it accounted for prepaid subscriptions in 2005-06. In prior years, 75% of the total amount paid for subscriptions was established as a prepaid as it was assumed that most

subscriptions ran on a calendar year. In 2005-06, this methodology was modified to reflect the actual subscription purchase date and duration by category of subscription.

Other Prepaids

As part of its objective to disseminate scientific knowledge, NRC manages scientific conferences. Historically, expenses paid in advance of the conference were expense as incurred. New in 2005-06 is the establishment of a prepaid for these expenses.

The other area where changes have been made is the establishment of a prepaid for payments in lieu of taxes (property taxes).

NRC establishes prepaid expenses for items that exceed a threshold of $5 thousand.

Inventory for Consumption

Physical inventory counts were done in 2005-06 on 7 stores out of 14 which represented the larger stores carrying over 70% of the value of NRC's inventory for consumption. A significant effort was made to identify stock that was obsolete or incorrectly valued, resulting in write downs of $378 thousand. This write down was recognized as of March 31, 2005 as it was believed that the conditions that led to the write down existed at that time. An allowance for obsolescence was also created to reflect the value of stock that had not moved for 5 years. This was approximately 15% of the value on hand.

Inventory for consumption went down by an additional $202 thousand over March 2005 levels due to the continued effort to reduce stock on hand.

Capital Assets

Buildings and Facilities

In 2005-06, renovations / additions were made to NRC buildings and facilities totaling $24.4 million. Of this amount $13.5 million was for the construction of a new laboratory on the campus of the University of British Columbia in Vancouver for NRC's Institute for Fuel Cell Innovation, $2.9 million was for the Industrial Partnership Facility at NRC's Institute for Biodiagnostics in Winnipeg, $2.4 million was for the animal housing facility on the Montreal Road campus, $793 thousand was for the recladding of the exterior of one of the administration buildings (M-19) and $570 thousand was for a hydro substation to support NRC's Institute for Aerospace Research Gas Turbine facility.

NRC had a number of scientific facilities that had never been recorded as an asset on the balance sheet. This was because it was the government's policy to expense assets when purchased. When this policy changed in 2001, NRC did not have reasonably reliable information on which to base a value for these older facilities and Public Works and Government Services (PWGSC) did not have a methodology for estimating this value. In order to comply with GAAP requirements in 2005-06, NRC engaged Public Works and Government Services to determine a value for these facilities. Based on the PWGSC information, facilities with an estimated historical cost of $104.8 million, with corresponding accumulated depreciation of $73.1 million, were added in our accounts. This addition was recognized as at March 31, 2005.

Corrections were made to the financial statements, as at March 31, 2005 to reclassify assets from machinery and equipment to facilities totaling $5.4 million for the NRC's Canadian Neutron Beam Laboratory, and to record an asset under construction of $6.7 million for a facility at NRC's Institute for Biodiagnostics that had been expensed as incurred instead of capitalized. Other adjustments were made to put buildings and facilities under construction into service totaling $88.4 million and to reclassify fit up and a parking lot for NRC's National Institute for Nanotechnology to leasehold improvements from building ($3.3 million). Lastly, a NRC building on the University of British Columbia campus with a cost of $10.7 million was reclassified from a capital asset to a capital asset held for sale.

Machinery, equipment, furniture and Informatics equipment

Approximately $44.0 million was expended on these items in 2005-06, net of trade-in allowance of $537 thousand. The significant purchases were:

- A 3 Tesla Magnetic Resonance Imaging System for $3.6 million for NRC's Institute for Biodiagnostics.
- Two transmission electron microscopes to fit up NRC's National Institute for Nanotechnology valued at $2.7 and 1.0 million each.
- $1.6 million in costs for software being developed in house for the information access and delivery service provided by NRC's Canadian Institute for Scientific and Technical Information.
- A mass spectrometer worth $976 thousand for NRC's Institute for National Measurement Standards.
- An Imprio 100 System and an X ray Diffractometer costing $959 thousand and $628 thousand respectively for NRC's Institute for Microstructural Sciences.
- A high performance computational facility costing $610 thousand for NRC's Institute for Aerospace Research.
- A friction stir welding machine valued at $565 thousand for NRC's Industrial Materials Institute.

The balance of the expenditures was for machinery, equipment, furniture and informatics equipment costing less than $500 thousand each.

In 2005-06 a physical verification was taken of NRC's assets. Particular care was taken to identify assets that no longer had a useful purpose, or that had been broken up into parts. As a result of this physical count, assets with a net book value of $1.5 million (historical cost value of $51.8 million) were removed from NRC's books. As these items were deemed obsolete at the beginning of 2005-06, this write off was recognized as of March 31, 2005.

Other assets with a historical cost of $17.0 million and a net book value of $636 thousand were disposed of in 2005-06 as part of ongoing operations.

Corrections were made to closing balances as at March 31, 2005 to reclassify software developed in house from asset under construction to in service and to adjust accumulated depreciation.

Leasehold Improvements

$5.4 million was expended in 2005-06 for NRC's National Institute for Nanotechnology (NINT) to fit up their premises in the leased building from the University of Alberta.

Reclassifications recognized in 2004-05 were made to reclassify a parking lot and fit up of the building for NINT to leasehold improvements from building ($3.3 million) and expense ($637 thousand).

Leased Capital Asset

The capital lease amount is for a building and land on the campus of the University of Western Ontario, which NRC leases for $1 per year. In previous years NRC did not recognize the value of this lease on its financial statements. In 2005-06, NRC recorded the lease as a capital lease valued at $10 million which represents the market value of the building in 1997. NRC's asset balance as at March 31, 2005 was amended to reflect this change in accounting policy.

Accounts Payable

Historically NRC accrued expenses for physical goods or services that had been received but not paid for, but did not accrue for items like payments in lieu of taxes (property taxes). Commencing in 2005-06, NRC began accruing for all material expenses and restated its March 31, 2005 accounts payable balance to reflect this.

The increase in accounts payable from March 31, 2005 is attributable to higher expenditures in 2005-06, as well as higher accruals for IRAP payments. IRAP accruals have increased due to more stringent requirements by NRC to have supporting documentation for claims before releasing payments.

Deferred Revenue

Specified Purpose Accounts

NRC undertakes collaborative work with clients for the mutual benefit of both parties. Funding provided by the collaborator is placed in a Specified Purpose Account (SPA) and used over the duration of the project. Amounts remaining in the SPA at year end are recorded as deferred revenue as it is expected that it will be used in the upcoming year on the project.

Research Press

The Canadian Institute for Scientific and Technical Information publishes research journals which are available for purchase on a subscription basis. When NRC receives payment for the subscription, it records the amount as deferred revenue and then recognizes the revenue each month as the journal is issued.

Relocation of the Institute for Fuel Cell Research

NRC currently occupies a building on leased land on the campus of the University of British Columbia (UBC) in Vancouver. At the request of UBC, NRC agreed to construct a new building on the campus and relinquish the existing building and land lease for $15.0 million. As NRC has not yet vacated the old building, the $15.0 million received is being recorded as deferred revenue. It will be recognized when the old building is turned over to UBC.

The change in deferred revenue over 2004-05 is mostly related to $10.1 million received from UBC

in 2005-06.

Conference and Seminar Registration

NRC conducts many conferences and seminars, which often require registration many months in advance of the conference date. Receipts from registration are recorded as deferred and recognized when the conference takes place.

Contributions Related to Leased Capital Asset

The capital lease amount is for a building and land on the campus of the University of Western Ontario, which NRC leases for $1 per year. An amount equal to the value of the leased capital asset was considered a non-monetary contribution and was established as deferred revenue. It is being recognized as revenue on the same basis as the amortization of the leased capital asset.

Employee Future Benefits

In prior years this allowance was recorded by Treasury Board on behalf of departments. In 2005-06, NRC was required to record this liability on its own balance sheet in order to be compliant with GAAP and Treasury Board accounting policy. The amount recorded for March 31, 2005 was $49.6 million. The amount recorded as at March 31, 2006 was $55.3 million. The increase is due to a change in the rate from 21.79% of salary to 23.2% of salary. This change was a result of an actuarial review undertaken by Financial Management and Analysis section, Office of Comptroller General, Treasury Board Secretariat.

Environmental Liabilities

An environmental liability was established for $300 thousand for a contaminated site at Penticton, B.C. The site is a borrow pit used for construction projects that was subsequently used as a dumping site. The $300 thousand is an estimated cost to remediate the site. In prior years, this liability was not recorded.

National Research Council of Canada

Statement of Management Responsibility

Responsibility for the integrity and objectivity of the accompanying financial statements for the year ended March 31, 2006 and all information contained in these statements rests with the Council's management. These financial statements have been prepared by management in accordance with Treasury Board accounting policies and year-end instructions issued by the Office of the Comptroller General which are consistent with Canadian generally accepted accounting principles for the public sector.

Management is responsible for the integrity and objectivity of the information in these financial statements. Some of the information in the financial statements is based on management's best estimates and judgment and gives due consideration to materiality. To fulfill its accounting and reporting responsibilities, management maintains a set of accounts that provides a centralized record of the Council's financial transactions. Financial information submitted to the Public Accounts of Canada and included in the Council's Performance Report is consistent with these financial statements.

Management maintains a system of financial management and internal controls designed to provide reasonable assurance that financial information is reliable, that assets are safeguarded and that transactions are in accordance with the Financial Administration Act, are executed in accordance with prescribed regulations, within Parliamentary authorities, and are properly recorded to maintain accountability of Government funds. Management also seeks to ensure the objectivity and integrity of data in its financial statements by careful selection, training and development of qualified staff, by organizational arrangements that provide appropriate divisions of responsibility, and by communication programs aimed at ensuring that regulations, policies, standards and managerial authorities are understood throughout the Council.

The role of the Audit, Evaluation, and Risk Management Committee of the National Research Council of Canada, that was established in June 2005, is to ensure that the proper review procedures are in place, to obtain the results of the audits and evaluations, especially in sensitive areas and in areas of concern and to be informed of the corrective actions taken or planned to be taken by management.

The financial statements of the Council have been audited by the Auditor General of Canada, the independent auditor for the Government of Canada

Dr. Pierre Coulombe
President

Daniel Gosselin, FCA
Chief Financial Officer

Ottawa, Canada
June 28, 2006

Auditor General of Canada
Vérificatrice générale du Canada

AUDITOR'S REPORT

To the National Research Council of Canada
and the Minister of Industry

I have audited the statement of financial position of the National Research Council of Canada (the Council) as at March 31, 2006 and the statements of operations, equity of Canada and cash flow for the year then ended. These financial statements are the responsibility of the Council's management. My responsibility is to express an opinion on these financial statements based on my audit.

I conducted my audit in accordance with Canadian generally accepted auditing standards. Those standards require that I plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In my opinion, these financial statements present fairly, in all material respects, the financial position of the Council as at March 31, 2006 and the results of its operations and its cash flows for the year then ended in accordance with Canadian generally accepted accounting principles.

Further, in my opinion, the transactions of the Council that have come to my notice during my audit of the financial statements have, in all significant respects, been in accordance with the *Financial Administration Act* and regulations, the *National Research Council Act* and regulations and the by-laws of the Council.

Sheila Fraser

Sheila Fraser, FCA
Auditor General of Canada

Ottawa, Canada
June 28, 2006

240 rue Sparks Street, Ottawa, Ontario K1A 0G6

National Research Council of Canada
Statement of Financial Position
as at March 31

(in thousands of dollars)	2006	2005
ASSETS		
Financial Assets		
Due from the Consolidated Revenue Fund	177,097	165,984
Accounts receivable and advances (Note 5)	21,089	25,949
Inventory for resale	3,589	3,334
Capital Assets held for sale (Note 8)	7,630	7,630
Equity investments (Note 6)	1,055	803
Endowment fund investments (Note 7)	4,077	3,925
	214,537	207,625
Non-Financial Assets		
Prepaid expenses	5,470	4,389
Inventory for consumption	2,216	2,418
Capital assets (Note 8)	543,824	528,579
	551,510	535,386
TOTAL ASSETS	766,047	743,011
LIABILITIES AND EQUITY OF CANADA		
Liabilities		
Accounts payable and accrued liabilities (Note 9)	123,471	109,696
Vacation pay and compensatory leave	36,986	33,552
Deferred revenue (Note 10)	42,794	30,837
Employee future benefits (Note 11)	55,269	49,571
Environmental liabilities (Note 12)	300	300
	258,820	223,956
Equity of Canada	507,227	519,055
TOTAL LIABILITIES AND EQUITY OF CANADA	766,047	743,011

Contingent liabilities (Note 12) and contractual obligations (Note 13)

The accompanying notes form an integral part of these financial statements.

Approved by the Council:

Dr. Pierre Coulombe
President

Daniel Gosselin, FCA
Chief Financial Officer

National Research Council of Canada
Statement of Operations
for the year ended March 31

(in thousands of dollars)	2006 (Note 3)
Expenses (Note 14)	
Research and development	566,534
Technology and Industry support	266,296
	832,830
Revenues (Note 15)	
Research and development	96,363
Technology and Industry support	63,503
	159,866
Net Cost of Operations	672,964

The accompanying notes form an integral part of these financial statements.

National Research Council of Canada
Statement of Equity of Canada
for the year ended March 31

(in thousands of dollars)	2006 (Note 3)
Equity of Canada, beginning of year	519,055
Net cost of operations	(672,964)
Net cash provided by Government (Note 4)	624,083
Change in due from the Consolidated Revenue Fund	11,113
Services received without charge (Note 16)	25,940
Equity of Canada, end of year	507,227

The accompanying notes form an integral part of these financial statements.

National Research Council of Canada
Statement of Cash Flow
for the year ended March 31

(in thousands of dollars)	2006
	(Note 3)
Operating Activities	
Net cost of operations	672,964
Non-cash items	
Amortization of capital assets	(57,916)
Gain on sale of equity investments	1,935
Loss on disposal of capital assets	(490)
Services received without charge (Note 16)	(25,940)
Variations in Statement of Financial Position	
Decrease in accounts receivable and advances	(4,860)
Increase in inventory for resale	255
Increase in endowment fund investments	152
Increase in prepaid expenses	1,081
Decrease in inventory for consumption	(202)
Increase in liabilities	(34,864)
Cash used in operating activities	552,115
Investment Activities	
Acquisition of capital assets	74,334
Proceeds from sale of equity investments	(1,683)
Proceeds from disposal of capital assets	(683)
Cash used by investment activities	71,968
Financing Activities	
Net cash provided by Government of Canada (Note 4)	(624,083)

The accompanying notes form an integral part of these financial statements.

National Research Council of Canada

Notes to the Financial Statements

Year ended March 31, 2006

1. Authority and Objectives

The National Research Council of Canada (the Council) exists under the *National Research Council Act* (NRC Act) and is a departmental corporation named in Schedule II of the *Financial Administration Act*. The objectives of the Council are to create, acquire and promote the application of scientific and engineering knowledge to meet Canadian needs for economic, regional and social development and to promote and provide for the use of scientific and technical information by the people and the Government of Canada.

In delivering its mandate, the Council reports under the following program activities:

- research and development; and
- technology and industry support.

These program activities also include the Council's priorities of enhancing development of sustainable technology clusters for wealth creation and social capital as well as program management for a sustainable organization.

2. Summary of Significant Accounting Policies

These financial statements have been prepared in accordance with Treasury Board accounting policies and year-end instructions issued by the Office of the Comptroller General, which are consistent with Canadian generally accepted accounting principles for the public sector. The significant accounting policies are:

a) Parliamentary Appropriations

The Council is financed mainly by the Government of Canada through Parliamentary appropriations. Appropriations provided to the Council do not parallel financial reporting according to Canadian generally accepted accounting principles since appropriations are primarily based on cash flow requirements. Consequently, items recognized in the statement of operations and the statement of financial position are not necessarily the same as those provided through appropriations from Parliament. Note 4 provides a high-level reconciliation between the bases of reporting.

b) Net Cash Provided by Government

The Council operates within the Consolidated Revenue Fund, which is administered by the Receiver General for Canada. All cash received by the Council is deposited to the Consolidated Revenue Fund and all cash disbursements made by the Council are paid from the Consolidated Revenue Fund. The net cash provided by Government is the difference between all cash receipts and all cash disbursements including transactions between departments of the federal government.

c) Due from the Consolidated Revenue Fund

Due from the Consolidated Revenue Fund represents the amount of cash that the Council is entitled to draw from the Consolidated Revenue Fund without further appropriations.

d) Revenues / Deferred Revenue

- Revenue is recognized in the year in which the underlying transaction or event occurred that gave rise to the revenue.
- Revenue from license fees, joint research projects and other sources is deposited to the Consolidated Revenue Fund and is available for use by the Council.

- License fees received for future year license periods are recorded as deferred revenue and amortized over the license period.
- Funds received from third parties for specified purposes are recorded upon receipt as deferred revenue and recognized as revenue in the year in which the related expenses are incurred.
- Contributions of leased capital assets are deferred and amortized to operations on the same basis as the related depreciable capital assets.

e) Expenses

- Grants are recognized in the year in which entitlement of recipients has been established, while contributions are recognized in the year the conditions for payment are met.
- Vacation pay and compensatory leave are expensed as the benefits accrue to employees under their respective terms of employment.
- Services received without charge from other government departments and agencies are recorded as operating expenses at their estimated cost.

f) Employee Future Benefits

i) Pension Benefits

Eligible employees participate in the Public Service Pension Plan, a multiemployer plan administered by the Government of Canada. The Council's contributions to the Plan are charged to expense in the year incurred and represent the Council's total obligation to the Plan. Current legislation does not require the Council to make contributions for any actuarial deficiencies of the Plan.

ii) Severance Benefits

Employees are entitled to severance benefits under labour contracts or conditions of employment. These benefits are accrued as employees render the services necessary to earn them. The obligation relating to the benefits earned by employees is calculated using information derived from the results of the actuarially determined liability for employee severance benefits for the Government as a whole.

g) Accounts Receivable

Accounts receivable are stated at amounts expected to be ultimately realized; a provision is made for receivables where recovery is considered uncertain.

h) Conditionally Repayable Contributions

Conditionally repayable contributions are contributions that, all or part of which become repayable, if conditions specified in the contribution agreement come into effect. Accordingly, they are not recorded on the Statement of Financial Position until the conditions specified in the agreement are satisfied at which time they are then recorded as a receivable and a reduction in transfer payment expenses. An estimated allowance for uncollectibility is recorded where appropriate.

i) Contingent Liabilities

Contingent liabilities are potential liabilities, which may become actual liabilities when one or more future events occur or fail to occur. To the extent that the future event is likely to occur or fail to occur, and a reasonable estimate of the loss can be made, an estimated liability is accrued and an expense recorded. If the likelihood is not determinable or an amount cannot be reasonably estimated, the contingency is disclosed in the notes to the financial statements.

j) Environmental Liabilities

Environmental liabilities reflect the estimated costs related to the management and remediation of environmentally contaminated sites. Based on management's best estimates, a liability is accrued and an expense recorded when the contamination occurs or when the Council becomes aware of the contamination and is obligated, or is likely to be obligated to incur such costs. If the likelihood of the Council's obligation to

incur these costs is either not determinable or unlikely, or if an amount cannot be reasonably estimated, the costs are disclosed as contingent liabilities in the notes to the financial statements.

k) Inventory

Inventory for resale and for consumption is recorded at the lower of cost (using the average cost method) or net realizable value. The cost is charged to operations in the year in which the items are sold or used.

l) Equity Investments

Equity investments include shares in publicly and privately held companies. Equity investments are typically obtained as a result of debt settlement negotiations or as a result of non-monetary transactions (where financial assistance at better-than-market conditions was provided to firms through access to intellectual property, equipment and incubation space in laboratories) and are recorded at fair value. Fair value of equity investments is based on market prices. If the fair value of equity investments becomes lower than cost and this decline in value is considered to be other than temporary, the equity investments are written down to fair value. If the estimates of the non-monetary transactions cannot be determined, the equity investments are recorded at a nominal value.

m) Endowment Fund Investments

Endowments consist of restricted donations subject to externally imposed restrictions stipulating that the resources be maintained permanently. Income from the investment of endowments may only be used for the purposes established by the donors.

Endowments are recognized as an asset when the amount to be received can be reasonably estimated and ultimate collection is reasonably assured. Income from endowments is recorded as deferred revenue and recognized as revenue in the year in which the related expenses are incurred.

Funds received for endowments are invested in bonds and are carried at amortized cost. The premium or discount determined at the time of acquisition is amortized until the security's maturity. Fair value of bonds is based on market prices.

n) Foreign Currency Transactions

Transactions involving foreign currencies are translated into Canadian dollar equivalents using rates of exchange in effect at the time of those transactions. Monetary assets and liabilities denominated in a foreign currency are translated into Canadian dollars using the rate of exchange in effect on March 31. Gains and losses resulting from foreign currency transactions are included in other revenues in note 15.

o) Capital Assets

All capital assets and leasehold improvements having an initial cost of $5,000 or more are recorded at their acquisition cost. Contributed capital assets are recorded at market value at the date of contribution. The Council does not capitalize intangibles, works of art and historical treasures that have cultural, aesthetic or historical value. Assets acquired under capital leases are initially recorded at the present value of the minimum lease payment at the inception of the lease. Capital assets held for sale are recorded at the lower of their carrying value or fair value less cost to sell and no amortization is recorded. Amortization of capital assets is calculated on a straight-line basis over the estimated useful life of the asset as follows:

Asset Class	Amortization Period
Land	Not applicable
Buildings and facilities	25 years
Works and infrastructure	25 years
Machinery, equipment and furniture	10 years
Informatics equipment	5 years
Informatics software	5 years
Vehicles	5 years
Aircraft	10 years
Leasehold improvements	Lesser of the remaining term of the lease or useful life of the improvement
Assets under construction	Once in service, in accordance with asset class
Leased capital assets	In accordance with asset class

Where the Council enters into land leases at a nominal value, the transaction is considered as a non-monetary transaction and is recorded at fair value. Fair value of the transaction is based on market prices. If the estimates of the non-monetary transactions cannot be determined, the amount of the transaction is recorded at a nominal value.

p) Measurement Uncertainty

The preparation of these financial statements in accordance with Treasury Board accounting policies and year-end instructions issued by the Office of the Comptroller General, which are consistent with Canadian generally accepted accounting principles for the public sector requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses reported in the financial statements. At the time of preparation of these statements, management believes the estimates and assumptions to be reasonable. The most significant items where estimates are used are contingent liabilities, environmental liabilities, liability for employee severance benefits, provision for bad debts, and the useful life of capital assets. Actual results could significantly differ from those estimated. Management's estimates are reviewed periodically and, as adjustments become necessary, they are recorded in the financial statements in the year they become known.

3. Comparative Figures

This is the first year that a set of financial statements including Statement of Financial Position, Statement of Operations, Statement of Equity of Canada, and Statement of Cash Flow has been prepared in accordance with Canadian generally accepted accounting principles. It is neither practical nor cost effective for the Council to show certain comparative amounts because some required information is not readily available and some previous year's amounts would not be substantiated with any degree of precision.

4. Parliamentary Appropriations

The Council receives most of its funding through annual Parliamentary appropriations. Items recognized in the Statement of Operations and the Statement of Financial Position in one year may be funded through Parliamentary appropriations in prior, current or future years. Accordingly, the Council has different net results of operations for the year on a government funding basis than on an accrual accounting basis. The differences are reconciled in the following tables:

a) Reconciliation of net cost of operations to current year appropriations used

(in thousands of dollars)	2006
Net Cost of Operations	672,964
Adjustments for items affecting net cost of operations but not affecting appropriations:	
Add (Less):	
Revenue	159,866
Financial arrangements	(58,842)
Amortization of capital assets	(57,916)
Services received without charge	(25,940)
Specified purpose accounts disbursements	(20,994)
Employee future benefits	(5,698)
Vacation pay and compensatory leave	(3,434)
Increase in payment-in-lieu of taxes accrual	(670)
Increase in litigation claim expense accrual	(538)
Loss on disposal of capital assets	(490)
Expenses related to Justice Canada	(486)
Recovery of bad debts	745
Refunds of previous year's expenditures	719
Other	109
Total items affecting net cost operations but not affecting appropriations	(13,569)
Adjustments for items not affecting cost of operations but affecting appropriations:	
Add (Less):	
Acquisitions of capital assets and additions to assets under construction	74,334
Increase in prepaid expense	1,081
Increase in inventory	53
Total items not affecting cost of operations but affecting appropriations	75,468
Current year appropriations used	734,863

b) Reconciliation of Parliamentary appropriations provided to current year appropriations used

(in thousands of dollars)	2006
Parliamentary appropriations provided:	
Vote 55 – Operating expenditures	356,428
Vote 55 – Governor General's special warrants	37,877
Vote 60 – Capital expenditures	53,919
Vote 60 – Governor General's special warrants	13,548
Vote 65 – Grants and contributions	113,760
Vote 65 – Governor General's special warrants	27,070
Statutory amounts:	
Revenues pursuant to paragraph 5(1)(e) of the National Research Council Act	125,839
Contributions to employee benefit plans	56,606
Proceeds from the disposal of surplus Crown assets	683
Collection agency fees	66
Less:	
Revenues available for use in subsequent years	(40,628)
Lapsed appropriations	(10,305)
Current year appropriations used	734,863

c) Reconciliation of net cash provided by Government to current year appropriations used

(in thousands of dollars)	2006
Net cash provided by government	624,083
Revenue	159,866
Receipts and expenditures not affecting appropriations	(88,658)
Change in due from the Consolidated Revenue Fund	
Decrease in accounts receivable and advances	4,860
Increase in endowment fund investments	(152)
Increase in liabilities	34,864
Current year appropriations used	734,863

5. Accounts Receivable and Advances

(in thousands of dollars)	2006	2005
Accounts receivable from external parties	18,642	22,105
Accounts receivable from other Federal Government departments and agencies	3,536	5,690
Employee advances	54	65
	22,232	27,860
Less: allowance for doubtful accounts on external accounts receivable	(1,969)	(2,429)
	20,263	25,431
Repayable contributions	7,553	1,314
Less: allowance for uncollectibility	(6,727)	(796)
Net repayable contributions	826	518
Total	21,089	25,949

6. Equity Investments

Equity investments include shares in publicly and privately held companies. Of all portfolio investments where the Council holds an equity position, three were for debt settlements for a total value of $537,135 (three valued at $537,135 in 2005) and twenty-two were obtained by non-monetary transactions (twenty-one in 2005), of which eleven are inactive or have filed for bankruptcy. Estimates of the non-monetary transactions cannot be determined, as the value of the financial assistance is highly speculative.

The fair value of the equity investments as at March 31, 2006 was $1,567,687 (2005, $971,996).

7. Endowment Fund Investments

This account was established pursuant to paragraph 5(1)(f) of the *National Research Council Act* to record the residue of the estate of the late H.L. Holmes. Up to two thirds of the endowment fund's yearly net income is used to finance the H.L. Holmes award on an annual basis. The award provides the opportunity to post-doctoral students to study at world famous graduate schools or research institutes under outstanding researchers.

(in thousands of dollars)	2006
Restricted cash and investments, beginning of year	3,925
Net income from endowment	232
Awards granted	(80)
Restricted cash and investments, end of year	4,077

The portfolio had an average effective return of 5.53% (5.07% in 2005) and an average term to maturity of 5.21 years as at March 31, 2006 (4.78 years as at March 31, 2005). The fair value of the endowment investments as at March 31, 2006 was $4,135,889 (2005, $4,038,972).

8. Capital Assets

(in thousands of dollars)	Cost				Accumulated amortization					
Capital asset class	Opening balance	Acquisitions	Transfers, disposals and write-offs	Closing balance	Opening balance	Amortization	Disposals and write-offs	Closing balance	2006 Net book value	2005 Net book value
Land	10,912	-	-	10,912	-	-	-	-	10,912	10,912
Buildings and facilities	544,111	359	34,829	579,299	(272,317)	(21,458)	-	(293,775)	285,524	271,794
Works and infrastructure	19,454	13	730	20,197	(10,734)	(695)	-	(11,429)	8,768	8,720
Machinery, equipment and furniture	416,458	31,623	(7,906)	440,175	(250,615)	(26,896)	6,787	(270,724)	169,451	165,843
Informatics equipment	72,836	4,302	(9,491)	67,647	(57,751)	(5,188)	9,425	(53,514)	14,133	15,085
Informatics software	6,529	1,474	4,236	12,239	(1,603)	(1,822)	1	(3,424)	8,815	4,926
Vehicles	2,554	350	(193)	2,711	(1,930)	(239)	171	(1,998)	713	624
Aircraft	10,348	295	-	10,643	(8,833)	(187)	-	(9,020)	1,623	1,515
Leasehold improvements	3,907	-	-	3,907	(2,618)	(1,031)	-	(3,649)	258	1,289
Assets under construction	40,871	35,918	(39,762)	37,027	-	-	-	-	37,027	40,871
Leased capital assets	10,000	-	-	10,000	(3,000)	(400)	-	(3,400)	6,600	7,000
Total	1,137,980	74,334	(17,557)	1,194,757	(609,401)	(57,916)	16,384	(650,933)	543,824	528,579

Amortization expense for the year ended March 31, 2006 is $57,915,678.

During the normal course of operations, the Council entered into eight land lease agreements (eight in 2005) for a nominal annual cost of one dollar with universities. In these instances, the Council owns the building on the leased land. The fair value of these non-monetary transactions cannot be determined.

On March 21, 1996, the Council entered into a non-monetary transaction. The Council entered into a lease agreement with the University of Western Ontario for the relocation of the Integrated Manufacturing Technologies Institute (IMTI) whereby leased property was provided to the Council for twenty-five years at a nominal cost of one dollar. The Council has no obligations to the University of Western Ontario other than the relocation of the institute. The building was recorded as a leased capital asset at its fair value of $10,000,000. The annual amortization of the capital asset of $400,000 is exactly offset by the amortization of the deferred contribution related to the leased building.

On March 28, 2002, the Council entered into a non-monetary transaction with the University of Alberta. The Council entered into a lease agreement with the university for the housing of the Council's newly created National Institute for Nanotechnology (NINT), whereby leased property was provided to the Council at a nominal cost of one dollar for a period ending no later than July 25, 2007. The transaction was recorded as an operating lease where a revenue and an expense were recorded for $342,000.

On December 12, 2002, the Council reached an agreement with the University of British Columbia to relinquish an existing land lease and the building thereon for $15,000,000. These proceeds are recorded and presented as deferred revenue ($4,900,000 in 2005) until the disposal occurs in 2007.

The following table shows the carrying value of the capital assets held for sale:

(in thousands of dollars)	Cost	Accumulated amortization	2006 Net book value	2005 Net book value
Capital assets held for sale	10,674	(3,044)	7,630	7,630

9. Accounts Payable and Accrued Liabilities

(in thousands of dollars)	2006	2005
Suppliers	98,175	88,023
Payable to other Federal Government departments and agencies	15,339	13,139
Accrued salaries, wages and employee benefits	7,965	6,464
Sales tax payable	1,127	1,007
Contractor holdbacks	865	1,063
Total	123,471	109,696

10. Deferred Revenue

(in thousands of dollars)	2006
Deferred revenue - specified purpose accounts	
Balance, beginning of year	11,054
Funds received	22,536
Revenue recognized	(20,994)
Balance, end of year	12,596
Deferred revenue - other	
Balance, beginning of year	12,783
Funds received	18,614
Revenue recognized	(7,799)
Balance, end of year	23,598
Deferred revenue – contributions related to leased capital assets	
Balance, beginning of year	7,000
Contributions received	-
Contributions recognized as revenue	(400)
Balance, end of year	6,600
Total	42,794

11. Employee Future Benefits

Employees of the Council are entitled to specific benefits on or after termination or retirement, as provided for under various collective agreements or conditions of employment.

a) Pension benefits

The Council and all eligible employees participate in the Public Service Pension Plan, which is sponsored and administered by the Government of Canada. Pension benefits accrue up to a maximum of 35 years at a rate of two percent per year of pensionable service, times the average of the best five consecutive years of earnings. The benefits are integrated with Canada/Quebec Pension Plans benefits and they are indexed to inflation.

The expense amounts to $41,888,165 which represents approximately 2.6 times the contributions by employees. Both the employees and the Council contribute to the cost of the Plan. As at March 31, 2006, the contributions are as follows:

(in thousands of dollars)	2006
Council's contributions	41,888
Employees' contributions	15,818

The Council's responsibility with regard to the Plan is limited to its contributions. Actuarial surpluses or deficiencies are recognized in the financial statements of the Government of Canada, as the Plan's sponsor.

b) Employee severance benefits

The Council provides severance benefits to its employees based on eligibility, years of service and final salary. These severance benefits are not pre-funded. Benefits will be paid from future appropriations. Information about the severance benefits, measured as at March 31, is as follows:

(in thousands of dollars)	2006
Accrued benefit obligation, beginning of year	49,571
Expense for the year	8,707
Benefits paid during the year	(3,009)
Accrued benefit obligation, end of year	55,269

12. Contingent Liabilities

a) Environmental liabilities

Liabilities are accrued to record the estimated costs related to the management and remediation of contaminated sites where the Council is obligated or likely to be obligated to incur such costs. The Council has identified one site (one site in 2005) where such action is possible and for which a liability of $300,000 ($300,000 in 2005) has been recorded. The Council's ongoing efforts to assess contaminated sites may result in additional environmental liabilities related to newly identified sites, or changes in the assessments or intended use of existing sites. These liabilities will be accrued by the Council in the year in which they become known.

b) Claims and litigation

Claims have been made against the Council in the normal course of operations. Some of these potential liabilities may become actual liabilities when one or more future events occur or fail to occur. To the extent that the future event is likely to occur, and a reasonable estimate of the loss can be made, an estimated liability is accrued and an expense recorded on the Council's financial statements.

As at March 31, 2006, the Council had seventeen claims (eleven in 2005) outstanding of which five (none in 2005) related to pending charges that will likely result as a liability. Four of the claims can be reasonably estimated and one is currently undeterminable. A total accrued liability of $537,600 (nil in 2005) was recorded based on the Council's legal assessment of potential liability.

With respect to the claim for which the estimate of loss is undeterminable, the Research Council Employees Association (RCEA) filed a pay equity complaint, in 1999-2000, against the Council alleging that discrimination based on sex had occurred between 1985 and 2000. The RCEA requested that the Council retroactively increase the wage rates of employees to remedy the discrimination. In the opinion of management, the outcome of the complaint will result in a loss for the Council. The potential financial impact of this case could be significant however the amount of the liability cannot be reasonably estimated. Therefore, no liability has been recognized in the financial statements. This liability will be accrued by the Council in the year in which the amount of the loss can be reasonably estimated.

13. Contractual Obligations

The nature of the Council's activities can result in some large multi-year contracts and obligations whereby the Council will be obligated to make future payments when the services/goods are received. Significant contractual obligations that can be reasonably estimated are summarized as follows:

(in thousands of dollars)	**2007**	**2008**	**2009**	**2010**	**2011 and thereafter**	**Total**
Transfer payments	104,520	64,932	55,898	55,000	24,000	304,350
Operating contracts	7,391	1,977	885	235	73	10,561
Total	111,911	66,909	56,783	55,235	24,073	314,911

14. Expenses

(in thousands of dollars)	2006
Salaries and employee future benefits	395,985
Grants and contributions	129,902
Utilities, materials and supplies	87,746
Professional services	64,044
Amortization	57,916
Transportation and communication	26,667
Bad debts	23,879
Repairs and maintenance	17,616
Payments in lieu of taxes	15,373
Rentals	5,460
Information	4,492
Awards	2,261
Cost of goods sold	838
Loss on disposal of capital assets	490
Other	161
Total	832,830

15. Revenues

(in thousands of dollars)	2006
Sales of goods and services	
Rights and privileges	5,834
Lease and use of property	3,060
Services of non-regulatory nature and other fees and charges	56,097
Sales of goods and information products	11,981
	76,972
Financial arrangements	58,842
Revenues from joint project and cost sharing agreements	20,994
Gain on sale of equity investment	1,935
Other	1,123
Total	159,866

16. Related Party Transactions

The Council is related as a result of common ownership to all Government of Canada departments, agencies, and Crown corporations. The Council enters into transactions with these entities in the normal course of business and on normal trade terms. Refer to Note 5 and Note 9 for receivable and payable to other Government departments and agencies. Also, during the year, the Council received services, which were obtained without charge from other Government departments. These services without charge have been recognized in the Council's Statement of Operations as follows:

(in thousands of dollars)	2006
Employer's contributions to the health and dental insurance plans provided by Treasury Board	24,478
Audit services provided by the Office of the Auditor General of Canada	427
Legal services provided by Justice Canada	376
Workers' compensation benefits provided by Human Resources and Social Development Canada	336
Payroll services provided by Public Works and Government Services Canada	163
Accommodation provided by Public Works and Government Services Canada	160
Total	25,940

The total of legal services provided by Justice Canada amount to $862,638. From this amount, $376,326 was provided without charge.

17. Financial Instruments

The Council's financial instruments consist of accounts receivable and advances, investments, accounts payable and accrued liabilities, and deferred revenue. Unless otherwise noted, it is management's opinion that the Council is not exposed to significant interest, currency or credit risk arising from these financial instruments. Unless otherwise disclosed in these financial statements, management estimates that the carrying values of the financial instruments approximate their fair value due to their impending maturity.

Table 3-12: Response to Parliamentary Committees, Audits and Evaluations for 2005–2006
Response to Parliamentary Committees
NRC did not participate in any Parliamentary Committees in 2005-2006 that required a response.
Response to the Auditor General
The Office of the Auditor General of Canada (OAG) conducted an audit of NRC in 2003-2004. The objectives of the audit, tabled in March 2004, were to assess NRC's systems and practices for setting strategic direction for its scientific research activities and to determine whether NRC managed activities to maximize results. The audit also assessed whether NRC measured and appropriately reported the results and impacts of its efforts. Below is a summary of NRC's actions in 2005-2006 in response to the OAG's recommendations. NRC has also developed an Action Plan for the period 2005-2007 to continue.

OAG Recommendations	NRC Progress
Corporate Governance • Review corporate senior management structure to ensure appropriate accountability • Define role of NRC Council to meet responsibilities under the *NRC Act* • Put in place governance mechanisms to implement NRC Council role	• *October 2005 - NRC's President introduced New Organizational and Accountability Structure* - Vice-Presidents are now responsible for a specific portfolio of Institutes, programs, initiatives and activities that are coherent, inter-related and that can be managed strategically. As the new structure is operationalized in 2006, there will be an increased emphasis on accountability in the relations between NRC's President and the VPs, and between the VPs and their respective senior managers. The Advisory Boards of NRC Institutes now have a direct reporting relationship to the VPs. Vice-Presidents will now have specific responsibility for the development and management of NRC's scientific assets; for integration within and between their portfolios; for people leadership and succession planning; for performance management; and for managing the financial and human resources within their respective portfolios. *(Supporting document provided: President's message to NRC, October 2005)* • *February 2006 - New Position of VP Corporate Services* - This position was created and staffed to increase executive oversight for the corporate functions. • *July 2005 to present - Governance Framework for NRC Genomics & Health Initiative (GHI)* –Since approval of the NRC-GHI Governance Framework, steps have been taken to implement the governance structure. The GHI Directors General Committee has been established and has met several times. Additionally, the GHI Program Steering Committees have been put in place and are being using to provide guidance and oversight to the six GHI-3 research programs. The GHI Coordination Office has commenced preliminary planning for the GHI Phase IV competition. NRC continues to monitor progress of this governance framework - a model that will be considered for future horizontal initiatives at NRC. • *September 2005 – NRC Council Membership Profile Developed* – The profile was approved by the Executive Committee of Council. • *January 2006 - Briefing Material for New Minister's Office* – Material was provided to the

OAG Recommendations	NRC Progress
	Minister's office to help them understand NRC's needs with respect to the competencies of Council members. Meetings will be arranged with the appropriate ministerial staff, once they are in position (Spring 2006). • *Spring 2006 - Internal Mechanism for identification of Council Members* – This will be established using NRC Executives and the NRC Advisory Boards to identify suitable Council members, for consideration by the Executive Committee of Council.
Setting Corporate Strategic Direction • Develop a corporate business plan • Develop a priority-setting mechanism • Conduct comprehensive review of research areas	• *July 2005 – March 2006 – NRC Renewal Initiative – Foresight, Strategic Direction and Strategy Development* - NRC undertook extensive consultations with experts and strategic thinkers and leaders from SBDAs, academia, the S&T community and industry (over 400 stakeholders) to review the value and continuing relevance of NRC's program activities, define the organization's future opportunities and new direction. The priorities identified through this process, are consistent with: NSERC – Strategic Partnerships Program, SSHRC – Strategic Research Grants and Strategic Joint Initiatives, Beyond the Horizon – National Challenges, CIHR – current opportunity research areas, and the Canadian Space Agency as well as those cited by the Office of the National Science Advisor – S&T in Support of Mission Critical Goals. Thus, NRC is building its strategy on the articulated priorities shared by the majority of those participating in the national science and innovation system. NRC also undertook a comprehensive foresight exercise to identify future S&T needs into 2020. A strategic framework has been developed summarizing the broad NRC directions resulting from this work. NRC has also drafted its Renewal Strategy. The strategy includes strategic outcomes and objectives, and associated milestones of planned business priorities (over a 1-5 year period). The plan was presented to NRC's Council on 23 March 2006 for approval. The last phase of NRC's Renewal Initiative will be implementation of the new strategy (May 2006 onwards). It is anticipated that full implementation of the strategy will take five years. • *July 2005 – March 2006 - NRC's Corporate Planning and Performance Management Process and Supporting System* – The process re-design was approved by NRC's Senior Executive Committee in December 2005. This phase of the project included consultations and validation with NRC staff and management, including a risk assessment. Based on the results of the risk assessment, NRC is implementing the process on a gradual, step by step pilot approach. In February 2006, NRC began its pilot of the business planning process to be completed in May 2006. Other pilots to be undertaken in 2006-2007 include: Mid-Year and End of Year Performance Reviews; Integrated NRC Environmental Scan; Senior Executive Committee Priorities Retreat; MG Leadership Forum and Process Orientation Workshops. This initiative will support: NRC's strategy implementation, NRC's new accountability structure, senior management decision-making (resource allocation/re-allocation, priorities and planning), including integration of functional planning (human resources, capital assets and finance) with Portfolio and Institute business planning. As part of this solution, Institute and VP Portfolio business plans will be aligned with NRC's Renewal Strategy, and management performance agreements will be closely linked to business plan commitments. This project is governed by a

OAG Recommendations	NRC Progress
	Planning, Risk and Performance Management Committee (7 Directors General and VP, Corporate Services). Remaining phases of the project include: *Process Implementation (February 2006 – April 2008)* - Implement the process on a gradual basis using a step by step approach—introducing a series of process activities in logical sequence over the two-year period; *System Requirements (November 2006 – April 2007)* - Identify the functional requirements of an electronic system to support the process and build upon NRC's existing IM/IT systems (i.e., NRC's current data warehouse and reporting software), as well as develop interim strategies for data collection pre-system implementation; and *System Deployment (September 2007 - April 2008)* - Pilot and implement an electronic system across NRC. • *January – March 2006 – NRC Portfolio Management Paper* – this was developed to provide a starting point for examining implications of portfolio management at the VP level at NRC. The paper includes NRC perspectives related to portfolio management, key success factors based on literature review, related issues and challenges, roles and responsibilities and potential approaches for VP consideration. • *October 2005 - NRC Corporate Risk Profile* – The profile which includes both strategic and operational risks, was developed with involvement of NRC's Senior Executive and Corporate Branch Directors General over a nine month period. Since this time, the profile has been actively applied in support of management decisions on corporate initiatives: risk assessment of options for the Canadian Neutron Centre; risk assessment for the Human Resources Branch Diversity/Employment Equity Program; risk assessment of the new corporate planning and performance management process; risk assessment of NRC's Renewal Strategy; and Institute risk management pilots. The result is a consistent application of risk management principles and approach at all levels of NRC decision-making – Organizational, Institute, Project, and Special Program levels. The objective of NRC's risk management initiative is to improve planning and performance management practices at NRC and integrate information (plans, risk, performance, resources—financial, human, capital assets) to support effective and efficient priority-setting and decision-making. NRC's efforts in this area are being recognized by TBS. In NRC's 2005 Management Accountability Framework assessment by TBS, NRC's risk management practice was rated one level above the average rating received by the 35 federal organizations assessed. *(Supporting document provided: NRC Corporate Risk Profile)* • *2005-2006 – NRC Evaluation Function Activities* – NRC continues to evaluate the continued relevance and value of its programs and initiatives based on a risk-based evaluation plan. NRC has in place a "live" evaluation shop where evaluations are conducted in-house by trained, practicing evaluators. The level of evaluation activity in 2005-2006 includes: - Ten evaluations and one Results Capacity Check were launched in 2005 and are scheduled to wrap up in 2006 (Genomics & Health Initiative, Genomics R&D, six Central/Western NRC Cluster Initiatives, Long Range Plan for Astronomy – Herzberg Institute of Astrophysics, International Affiliations) - Participation in two interdepartmental evaluations (Youth Employment Strategy and

OAG Recommendations	NRC Progress
	Enhanced Representation Initiative) - Completion of 10 Results-based Management & Accountability Frameworks - Development of a Baseline Methodology for the measurement of Technology Clusters, including 2 pilot studies and 4 more to be completed by end of fiscal 2005-06. • Senior management commitment to assessing the continued relevance and value of NRC initiatives is also demonstrated by the increase in resource levels to the evaluation function in 2005-2006 (three new FTEs and an increase of $200K to the operational budget). NRC's efforts in this area are also being recognized by TBS. In NRC's 2005 Management Accountability Framework assessment by TBS, NRC's evaluation function was rated two levels above the average rating received by the 35 federal organizations assessed.
Research Management at Institute Level • Improve priority-setting framework • Clearly document key project decisions	• *February 2006 - Completion of Research Management Self-Assessment Tool Pilots* - NRC completed its pilots with three Institutes. The pilots included pre-assessment orientations and full day facilitated workshops to identify gaps and opportunities in priority management areas. The tool is consistent with the measures in TBS' Management Accountability Framework, complemented with specific management areas unique to an R&D organization (e.g., good practices in technology transfer). This tool has received notable interest by organizations such as the Museum of Civilization, AAFC, US-NIST and the Strathclyde University in Scotland. Results of the pilots will be presented to NRC's Senior Executive Committee in spring 2006, along with recommendations for making the tool widely available across NRC Institutes. *(Supporting paper provided: NRC Research Management Self-Assessment Paper)* • *2005-2006 Completion of Risk Management Pilots* – Pilots with three NRC Institutes were completed in February 2006. The focus of the three pilots was on providing risk management orientation and conducting risk assessments of Institute strategic plans. Results of the pilots will be presented to NRC's Senior Executive Committee in spring 2006, along with recommendations for integrating risk management into NRC's corporate planning & performance management process. An additional risk management project was also undertaken in 2005-2006 - development and implementation of a risk management module for project management at NRC's Institute for Aerospace Research. • *October – December 2005 - NRC Project Management Best Practices across the Project Life Cycle* – NRC undertook this study to: gain an appreciation for the level and degree of rigor of project management as it is practiced within NRC; identify any best practices in project management as defined by NRC Institutes and relating those to project selection, project planning, project implementation and project closure; solicit opinions as to benefits and obstacles NRC Institutes face when implementing project management; identify any common practices in project management that could be applied organization-wide; and compare the results to best practices identified in recent literature. NRC will be using the results of this study as input to future development of a project management framework for NRC.

OAG Recommendations	NRC Progress
Human Resources Management • Set strategic direction for human resources management, with clear goals and measurable objectives in partnership with senior management • Develop comprehensive human resources management action plan to implement strategic direction	• *2006-2008 - HR Planning Integration* – a pilot project is currently underway to fully integrate HR planning wit h the overall corporate planning and performance management process. This will include development of the business planning process and templates at the VP Portfolio and Institute levels aligned with NRC's new corporate strategic plan. These will include the required HR planning elements in support of key strategic HR objectives (July 2006); full implementation of the HR planning process is expected in 2007-2008. • *2006-2007 - Environmental Scanning and Corporate HRM Strategic Plan* – building on NRC's Renewal Initiative and accompanying Strategic Framework, a comprehensive environmental HR scan is currently underway (to be completed May 2006); this two-pronged (internal/external) environmental HR scan will be conducted along the main organizational thrusts. The results of this scan will then be used to establish a revised HRM Strategic Plan (scheduled to be completed in Fall 2006) • *2006-2007 – HR Performance Measurement* – NRC has hired a dedicated HR resource to refine core and supporting HR performance indicators. Draft HR indicators have been established in Hiring, Employment Equity/Diversity and MG (Executive) Performance – the latter is in the form of an Accountability Management Agreement (AMA) in keeping with NRC's new organizational and accountability structure. Further refinement of NRC's HR "Scorecard" and associated systems, will be carried out throughout 2006-2007. • *June 2005 - Renewal Initiative --Core Competency Assessment* – NRC's Human Resources Branch led the NRC Core Competency Assessment project as key input to the NRC renewal process. This included examining NRC's culture, S&T core competencies and process competencies. For the S&T core competencies, NRC consulted with experts from Battelle and the Observatoire S&T. External data (bibliometric analysis of peer reviewed articles written as a result of NRC research and NRC patent citations) and internal data (licensing revenues and facilities) were used to determine the eight broad areas in which NRC does internationally recognized work. Process competencies were evaluated against two frameworks: Prahalad and Hamel's definition of a core competency, and Galbraith's model. In the second phase of this project, NRC drilled down into the specific competencies that underpinned the broad areas identified in the foresight/insight phase of NRC's Renewal Initiative. This data was gathered internally by questionnaire. It was used as an initial screening tool in assessing the renewal challenges identified, and was used as input to NRC's portfolio positioning and strategy development. On November 24, 2005, over 40 scientists from across NRC met to identify disruptive technologies, or areas of science and technology which are likely to be transformed by breakthroughs in the next generation and in which the NRC should consider investing in competency development. The results of this workshop were disseminated to staff via the NRC Intranet and are also providing input to the renewal process.
Performance Measurement and Reporting • Establish resourced plan for implementing new performance	• *April 2006 – March 2007 - Revised NRC Performance Measurement Framework* – This

OAG Recommendations	NRC Progress
management framework • Establish performance indicators and targets for expected results and link costs to results	project will begin in April 2006, once NRC's Renewal Strategy is finalized. It will build upon the preliminary performance measurement framework in NRC's Renewal Strategy. The framework will be closely linked to the Renewal Strategy goals, outcomes and milestones. It will include performance indicators to measure progress towards intended outcomes as well as annual targets. Revision of NRC's Management, Resources and Results Structure will take place at the same time, mapping out NRC results to financial and non financial information on the basis of NRC's Renewal Strategy outcomes and NRC's reporting accountability structure. • *February 2006 – March 2007 - NRC Integrated Corporate Planning & Performance Management Solution* – NRC is starting to implement this initiative on a pilot basis in 2006-2007, and will be supporting the implementation phase of NRC's Renewal Strategy. Two pilots will take place in support of improving NRC's performance management and reporting approach: 1) Pilot on Business Planning Process (February – May 2006); and 2) Pilot on Mid-Year and End-of-Year Performance Review (June 2006 – March 2007). Key performance management elements of these pilots include: developing business planning templates and plans with three NRC Institutes, including development of performance indicators to measure progress against plan commitments (i.e., business and management priorities, expected results, HR, financial and capital assets); and undertaking performance reviews against plan commitments twice in the year to support senior management decisions on upcoming priorities and allocation/re-allocation of resources, as well as to support external reporting requirements.

Internal Audits Completed in 2005-2006
Internal Audits • No internal audits completed in 2005-2006.

Internal Evaluations Completed in 2005-2006
Internal Evaluations • Genomics and Health Initiative (http://www.nrc-cnrc.gc.ca/aboutUs/audit_e.html)

Internal Evaluations – Update on Recommendations from Previous Evaluations	
2001-2002 Evaluation of Industrial Research Assistance Program (NRC-IRAP)	
Recommendation	Progress Made in 2005-2006
The evaluation recommends that IRAP increase the level of funding per client for research and development projects. In support of this, consideration should be given to seeking an increase to IRAP's non-repayable contribution budget in order to reach more clients and provide more funding per client. Consideration should also be given to exploring "top up" programs to increase the level of funding available to clients. Without an increase in IRAP's contribution budget, IRAP will have to make trade-offs--the key one being to reduce its client reach (i.e., in order to provide more funding per client)--to maximize IRAP's value to SMEs and Canada.	NRC-IRAP's budget decreased with the loss of the regional economic development agency funds starting in 2005 with FedNor. Today NRC-IRAP has $12M less funds to allocate for projects on behalf of the regional economic development agencies. Each region has dealt with the situation differently with some providing less money to more clients and some providing more money to fewer clients. NRC-IRAP has explored "top up" programs and is currently working with other agencies (e.g., venture capital, regional agencies) on a one-on-one basis to increase the level of funding available to clients. In some regions, for example NRC-IRAP West and NRC-IRAP Quebec specific advisors are dedicated to seeking external funding for NRC-IRAP clients. On average, NRC-IRAP's client reach has been 2,500-3,000 funded clients annually with the maximum funding provided to any one client set at $500K per project.
IRAP should closely examine its advisory services to increase their value to clients and their cost-effectiveness. To do this, IRAP should consider reducing the array of advisory services available and focusing on core services used by clients; building on partnerships to complement IRAP's core advisory services; exploring whether the type and level of advice provided should be tailored according to the specific profiles and needs of different client groups (e.g., small versus medium-sized firms); clearly defining what constitutes IRAP advice and increasing client awareness of IRAP advice as a service; and determining the optimal level of resources that should be allocated between IRAP funding and advisory services to maximize cost-effectiveness.	NRC-IRAP provides a range of both technical and business oriented advisory services and linkages along with potential financial support to growth-oriented Canadian SMEs. Approximately 10,000 firms receive advisory services annually from NRC-IRAP of which 2,500-3,000 receive financial support. In 2000-2001, NRC-IRAP implemented a new performance framework based on its strategic plan for 1996-2001. The framework includes a series of indicators, information gathering tools and reporting templates designed to capture NRC-IRAP impacts on Canadian SMEs. During 2001-2002, the management team defined a new strategic plan for 2003-2008 including new activities and new initiatives that was contingent upon receiving additional A-base funding. In June 2004, the management team approved an update of the performance framework, which integrated the new strategic plan and ensured the alignment between activities and expected results and outcomes. However, due to the re-organization at NRC-IRAP in 2004, the implementation of this framework was put on hold. NRC-IRAP will commence implementing this revised framework in 2006-2007.
CTN should apply a nationally shared and understood vision, mission and strategic and operational objectives to function as a national network, supported by a nationally	In March 2004, in all but NRC-IRAP Quebec where the two synergistic networks continue to work together, CTN as a separate initiative for linking the innovation

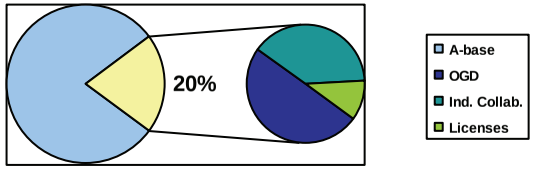
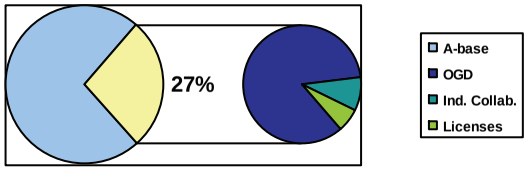
2001-2002 Evaluation of Industrial Research Assistance Program (NRC-IRAP)	
Recommendation	Progress Made in 2005-2006
shared business model that clearly articulates what CTN is about, what activities it undertakes, who its clients are, and how it is organized for reporting and accountability. Successful regional CTN practices should be considered and CTN expectations should be effectively managed (i.e., CTN resources should be aligned with the agreed upon vision, mission, objectives and business model).	system organizations, was discontinued with the realization of the extent of the duplication within the two networks. However the concept and CTN staff was merged into NRC-IRAP. All NRC-IRAP regions, like NRC-IRAP Quebec, continue to successfully use the Network Member Contribution Agreements as a key tool for engaging in relationships to enhance the scope and scale of services available to its clients (for example, Biomedical Commercialization Canada in NRC-IRAP West and Oceans Advance in NRC-IRAP Atlantic & Nunavut).
IRAP should consider improving and increasing IRAP knowledge transfer to SMEs through key partnerships with the Canada Institute for Scientific and Technical Information and other CTN members; enhancing partnerships with government laboratories and universities and building on successful IRAP relationships with NRC Institutes as a best practice; exploring opportunities to expand linkages through international networks by closely examining international networking practices established by similar programs abroad; and establishing networks within community technology clusters to enhance client access to strategic linkages.	NRC-IRAP is co-located and works extensively across Canada with NRC-CISTI. In recent years, as a result of a pilot initiated by NRC-IRAP Atlantic & Nunavut in 2004, NRC-IRAP and NRC-CISTI have been partnering to provide SMEs with competitive technical intelligence (CTI). Specifically in 2005-2006, NRC-IRAP Pacific had one and a half person years from NRC-CISTI based in Vancouver dedicated to helping ITAs help SMEs. In addition the region is looking at adding three CTI staff from NRC-CISTI via the $5M Commercialization fund. NRC-IRAP Québec supported the hiring of two NRC-CISTI resources to supply CTI service to clients. NRC-IRAP Ontario is reviewing the possibility of having NRC-CISTI supply this service to the Ontario Regional Innovation Networks. In NRC-IRAP Atlantic & Nunavut, there are four Information Specialists at NRC-CISTI and three Technical Business Analysts at NRC-IRAP who work together to provide firms with industry and product related CTI. At NRC-IRAP West, a collaborative initiative is underway with NRC-CISTI Winnipeg and there are active discussions for a CTI capability in Saskatoon related to value-added plan technologies. NRC-IRAP will continue with the current development and business plan to expand further opportunities with NRC-CISTI in delivering this service to NRC-IRAP clients. NRC-IRAP continues to develop relationships with other government departments such as Industry Canada, Natural Sciences and Engineering Research Council and Foreign Affairs. For example, Canada has been invited to join EuroTransBio with 6 EU countries. Foreign Affairs will manage this agreement on behalf of Canada and NRC-IRAP will take the lead for SME-led consortia projects. NRC-IRAP is involved with International Trade Canada through its posts around the world and continues to build on these relationships by participating in their training and orientation sessions as well as working with trade officers to arrange NRC-IRAP-led industry missions.

2001-2002 Evaluation of Industrial Research Assistance Program (NRC-IRAP)	
Recommendation	Progress Made in 2005-2006
	Different NRC-IRAP regions are working in various areas around the world (e.g., NRC-IRAP Pacific in Asia; NRC-IRAP West in the United States, Far East and Europe; NRC-IRAP Ontario in Spain and India; NRC-IRAP Quebec in France; and NRC-IRAP Atlantic & Nunavut in Europe especially in Scandinavian countries). In September 2005, the Confederation of Indian Industry and NRC-IRAP signed a two-year Memorandum of Understanding that sets out the groundwork for the development of linkages between the two countries in academia, government and the private sector. The first formal partnering session was held during the 11th Technology Summit & Technology Platform 2005 in New Delhi. NRC-IRAP was focused on engaging 7 companies (3 in Ontario, 2 in Alberta, 1 in Saskatchewan and 1 in BC) for partnering discussions with Indian companies around the area of application of life sciences to address rural issues. Two collaborations have since been confirmed. In October 2005, NRC signed a three-year Memorandum of Understanding with Spain's Centre for the Development of Industrial Technology. NRC-IRAP is the method of delivery on the action items described in the MOU. This agreement promotes, assists and funds the development of joint technology cooperation projects between SMEs from Canada and Spain in areas of mutual interest in order to generate economic benefits for both countries.
The evaluation recommends that IRAP establish national priorities and effectively manage them by identifying what is IRAP's core business and ensuring that adequate resources are dedicated to implementing and managing the core business; determining whether it is feasible to offer other initiatives based on IRAP's available resources and selecting those initiatives based on IRAP's new strategic plan, federal government priorities and a risk assessment; and establishing a comprehensive plan to monitor IRAP's core business and other initiatives implemented.	In 2002, NRC-IRAP developed its strategic plan and has been working towards achieving the core business objectives defined in that document. Presently, NRC-IRAP's is undergoing a review of its financial framework in relation to the government's priorities and NRC-IRAP's mandate.
IRAP should consider having a portfolio that seeks an optimal mix of clients based on regular assessment of Canadian technologically-based SME needs and opportunities, IRAP client profiles, IRAP's budget and priorities, and federal government priorities. IRAP should strive to have a portfolio that includes attraction of new clients, and ensure that ITAs and IRAP regions have adequate capacity and responsibility to seek an optimal mix of clients (e.g., adequate financial resources, access to tools such as technology foresight and roadmaps, PPRs).	In the past few years, NRC-IRAP has been working towards implementing a portfolio management approach to deliver its services to SMEs. NRC-IRAP improved its program delivery organizational structure by adding a layer of management personnel (director level) tasked with providing more direct supervision to Industrial Technology Advisors, with the added benefit of providing a more granular level of portfolio management. In addition, the Program has added Innovation and Network Advisors and Business Analysts to more fully respond to client and regional economic needs. Moreover, through NRC-IRAP's strategic linkages with NRC-CISTI,

2001-2002 Evaluation of Industrial Research Assistance Program (NRC-IRAP)	
Recommendation	Progress Made in 2005-2006
	Canadian SMEs have improved access to CTI services. NRC-IRAP has also leveraged its historically strong relationships with over 180 of Canada's leading public and private sector research and technology-based organizations. Through these linkages, NRC-IRAP taps into the full power of Canada's Innovation System, regionally, nationally and internationally, for the benefit of Canadian SMEs. NRC clusters are led by NRC Institutes, which possess the knowledge and expertise needed to build and sustain them. NRC-IRAP plays an important role in building NRC-led clusters and others and optimizing commercialization efforts. The Program focuses on the firm-related elements of clusters ensuring that the resources firms need to grow are accessible and become the focal point of successful clusters and commercialization efforts. For example, in 2005-2006, NRC-IRAP has ensured that regional initiatives are addressed using a pan-Atlantic approach in regards to the Atlantic Cluster Initiatives. An example of Pan-Atlantic achievements includes amplified linkages between NRC-IRAP and NRC-CISTI resulting in synergies that are bringing value to cluster development. Another example includes NRC-IRAP's involvement in "Wellness West". Since the fall of 2002, NRC-IRAP, in partnership with nine other federal and provincial agencies in Western Canada have been working on initiatives to support Western Canadian small and medium-sized nutraceutical, functional food and natural health products enterprises. Under the banner of "Wellness West", an MOU is in the process of being signed and initiatives have included the development of a commercialization roadmap, technology infrastructure database, international outreach strategy (marketing and technology focus), development of a technology newsletter, a number of workshops and seminars, and the facilitation of Glycemic Index (GI) labelling in Canada, allowing basic GI information to be used on packaging.
IRAP should consider increasing the program's understanding and awareness of client management context and needs by increasing its use of CTN as a complimentary resource. This includes enhancing ITA access to CTN business expertise and tools for assessing the socio-economic prospect of client projects and clients' financial/ business health; and providing IRAP clients with access to CTN management expertise/ services.	As noted above, with the exception of CTN-Quebec, CTN has been repatriated back into NRC-IRAP. NRC-IRAP, using former CTN relationship building tools like the network member contribution agreement, has aggressively increased access for its clients to complimentary resources. NRC-IRAP has provided training across the country to provide a common language with regards to its business and management context. In recent years there has been a move to increased emphasis on assessing the suitability of the technology for the market place and its viability.

2001-2002 Evaluation of Industrial Research Assistance Program (NRC-IRAP)	
Recommendation	Progress Made in 2005-2006
The evaluation recommends that IRAP consistently collect and maintain data on client contacts and coordinates; the type of advice being provided to clients and on the clients receiving advice; and clients' profiles (e.g., industry sector, size). IRAP should also ensure that mechanisms are in place to provide adequate time and motivation for ITAs to enter information in the client management system (SONAR) and ongoing ITA awareness of IRAP's performance measurement system.	It is an ongoing challenge to collect all performance indicators in SONAR but NRC-IRAP management understand the importance of collecting this information and is continuing its efforts to capture more complete information on the firms it works with in the future.

2002-2003 Evaluation of the Institute for Chemical Process and Environmental Technology (NRC-ICPET)	
Recommendation	Progress Made in 2005-2006
In its current strategic planning exercise ICPET should attempt to develop a clearer vision for the Institute's research program, one that has a narrower and more manageable focus than the current program.	NRC-ICPET's vision and mission have been articulated in the strategic plan approved in October 2003, and refined in a communications strategy. The Institute's focus is on solution-oriented materials and chemistry of energy oriented processes; targeted application areas of oil sands and fuel cells, with anticipated growth of bioproducts - with approval of NRC-ICPET's Advisory Board and NRC Council. The number of projects was reduced from approximately 30 in 2002-2003 to 14 in 2005-2006.
ICPET should seek ways to increase the degree of integration of the research activities within the Institute.	A complete restructuring of the Institute was planned and implemented. The two Research Director positions were replaced by a single Research Director and a Director of Commercialization to integrate the R&D and provide focus for technology transfer. Autonomous research groups that led to fragmentation of research effort were replaced by a project oriented approach, with projects drawing on resources across the Institute from five new competency groupings.
ICPET should seek ways to increase interactions and build stronger ties with industry.	The position of Director of Research was created. Under the Director of Commercialization, Application Coordinators were created for oil sand, fuel cells, and bioproducts to build communities of interest in these sectors. A new generation environmental technology initiative was initiated and the Bioproducts Business Network (BBN) was brought in as facilitator and ongoing champion. Workshops in Ottawa (April 2005), hosted by NRC-ICPET, and in Kingston (January 2006) brought industry, universities, government labs together. Outcomes to date include the creation of an industrial research chair at the University of Ottawa and associated centre for technologies at Laflech Environmental; inclusion of NRC-ICPET in a Sustainable Development Technology Canada (SDTC) proposal by local solar

2002-2003 Evaluation of the Institute for Chemical Process and Environmental Technology (NRC-ICPET)	
Recommendation	Progress Made in 2005-2006
	company; initiation of an MOU between NRC-ICPET and regional economic development organizations – Ottawa Life Sciences Council/BBN, Eastern Lake Ontario Regional Innovation Network (ELORIN), Québec centre for biotechnology commercial development (CQVB).
ICPET should increase its interactions and collaborations with universities.	A new generation environmental technology initiative was initiated and BBN was brought in as facilitator and ongoing champion. Workshops in Ottawa and Kingston brought industry, universities and government labs together. Outcomes to date include the creation of an industrial research and chair at the University of Ottawa and associated centre for environmental technologies at Laflech Environmental; inclusion of NRC-ICPET in a SDTC proposal by local solar company. Adjunct professorships are encouraged by NRC-ICPET management and the Institute had 7 in 2005-2006 compared to 2 in 2002-2003. NRC-ICPET DG sits on the advisory board of the Fuel Cell Research Centre (Queens/Royal Military College).
ICPET should place emphasis on ensuring that it maintains an appropriately balanced research portfolio between long-term strategic research, near-term collaborative research, and applied research	Since the evaluation, NRC-ICPET has significantly increased its funding received from other government departments (long range research addressing national priorities); however, as a result collaborative research with industry has decreased. It is expected that the funding realized from the other government departments will cause the collaborative funding to increase continuously in the upcoming two years. **2002-03**  **2005-06** 

2002-2003 Evaluation of the Institute for Chemical Process and Environmental Technology (NRC-ICPET)	
Recommendation	Progress Made in 2005-2006
ICPET should seek ways to increase its visibility and raise its profile, both outside of and within NRC.	Developed a communication strategy for the Institute. Increased participation by NRC-ICPET staff on NRC committees (e.g., Planning, Risk, Performance Management; participation in renewal on several fronts; volunteered for risk management pilot; volunteered for business plan pilot; NCOSH membership), creation of regular e-bulletin on internal news circulated to VP and others. Application Coordinators link NRC-ICPET research programs with communities of interest. In 2005-2006, one RO was assigned part-time to NRCan. Participation in the new generation environmental technology initiative raised NRC-ICPET profile regionally (Ottawa, Kingston, Montreal triangle); initiation of MOU with regional economic development organizations (OLSC/BBN, ELORIN, CQVB).
In considering appropriate mechanisms for transferring and commercializing its technology, the Institute should try to achieve a better balance between traditional licensing and the formation of spin-off or spin-in enterprises	Report of invention meetings are held internally and tracked to measure progress. Commercialization potential is one of the criteria used to evaluate research projects annually.
The Sustainable Technology Office should concentrate in the future on developing its capabilities in sustainability analysis. In addition, a review of the STO's wider functions should be undertaken.	The Sustainable Technology Office was disbanded in 2005-2006 and replaced with a research project on Environmental Sustainability Analysis. NRC-ICPET researchers are co-leading a multi-departmental project to develop a tool for assessing sustainability of technologies.

2003-2004 Report of the Peer Review Committee on the Tri-University Meson Facility (TRIUMF)	
Recommendation - The Peer Review Committee:	Progress Made in 2005-2006
Taking note of the important role of joint appointments of scientists by TRIUMF and universities, encourages the management to further involve Canadian universities with its strategy and activities	TRIUMF continues to maintain its strong involvement with Canadian Universities. During the fiscal year 2005-06, TRIUMF entered into a joint appointment with the University of Guelph, and admitted St Mary's University as an Associate Member of the TRIUMF Joint Venture.
Endorses the clear strategic priorities put forward in the Plan, which aim at: o taking decisive steps to ensure that ISAC-II will be the world leader in isotope-separated re-accelerated radioactive ion beams with powerful, well optimized instrumentation, and catering to a broad international users community, and o participating successfully in ATLAS physics at CERN	The proven success of TRIUMF's ISAC facilities and its experimental program has clearly identified TRIUMF as a world-leader in radioactive ion beam (RIB) physics. With the recent inaugural operation of the ISAC-II super-conducting linac, TRIUMF is without question a unique facility in the world for this science and will remain a unique facility for the foreseeable future. TRIUMF currently has more internationally peer-reviewed requests for experimental beam time at the ISAC facility then it can possibly fulfill. In

2003-2004 Report of the Peer Review Committee on the Tri-University Meson Facility (TRIUMF)	
Recommendation - The Peer Review Committee:	Progress Made in 2005-2006
	2005, TRIUMF received a minimum of 19 requests (TRIUMF can only accommodate 8-10 experiments per year). TRIUMF has actively pursued funding for the ATLAS Tier-1 Data Centre, the next step in providing infrastructure for Canadian scientists wishing to participate in the ATLAS physics at CERN. As TRIUMF's current Five-Year Plan did not provide this funding, TRIUMF is looking outside the NRC Contribution for funding to build this unique computer/data transfer facility. On behalf of TRIUMF, Simon Fraser University has made an application to the Canada Foundation for Innovation (CFI) for partial funding of the Data Hub under the Exceptional Opportunities Fund. In March 2006, CFI made a final decision to award $8.178 million for the Data Hub. TRIUMF has approached the Province of British Columbia for the remaining funds.
Supports the procedure that the management intends to put forward so that it receives regular advice on the scientific and technical developments of the laboratory from ACOT, from the Board of Management, and from a new body derived from the Working Group which prepared the Five-Year Plan	In 2005-2006, TRIUMF management met two times in with the Advisory Committee on TRIUMF (ACOT), twice with the Agency Committee on TRIUMF (ACT) and five times with the Experiment Evaluation Committees (EECs). These three committees all have strong international membership. Meetings with user groups and with the TRIUMF Board of Management three times a year ensure that the TRIUMF Director receives the best advice and scientific input into the developments at the laboratory. Three committees were established to facilitate planning and coordination of ISAC activities: the ISAC Science Forum, the ISAC Beam Strategy Group, and the ISAC Operations Review Panel.
Notes that user liaison and communications could be improved and recommends that the laboratory address this appropriately	A bi-annual newsletter is distributed worldwide to all potential users since October 2002. An ISAC Scientific Forum composed of experimenters, spokespersons of approved experiments and some ISAC operation personnel meets every second week to review progress and keep the user community in tune with laboratory developments. Minutes of this meeting are available on a public website and distributed to 86 experimental spokespersons. An ISAC Experimental Facilities Forum, which involves the facilities coordinators, some local experimenters, and technical support personnel meets on alternate weeks to discuss plans with the users. An ISAC Science Seminar program was initiated in June 2003. Since 2003-2004, TRIUMF has had an ISAC Beam Development Strategy Group that includes representation from the Users Group.

2004-2005 Peer Review of the NRC Steacie Institute for Molecular Sciences (NRC-SIMS)	
Recommendation	Progress Made in 2005-2006
The Institute work at reducing fragmentation within SIMS by developing a process where multi- or inter-disciplinary research projects are identified and stronger teams of researchers with a common focus work on important long-range scientific problems	Based on an assessment of competencies, in July 2005, the Institute identified three areas of focus for the future: molecular diagnostics; materials for environmental remediation and alternate energy; and platforms for quantum technologies. These themes cross the Institute's former group boundaries and will therefore assist in increasing multi-disciplinary research projects at NRC-SIMS.
The Institute set up appropriate project structures and organizations so that multi- or inter-disciplinary research projects can take place.	In 2005-2006, the Institute moved from a group-based approach to resource allocation to a project-based approach. Principal investigators are required to complete proposals for new projects which identify annual project goals and resource requirements. Projects are internally evaluated and ranked. Annual project presentations take place each November to share information and provide updates on project progress to Institute staff. The institute project portfolio now includes a balance of competency building (discipline based) and interdisciplinary research projects.
SIMS work to better coordinate its technology transfer activities with the aim of being able to articulate how its inventions and creations are impacting existing or future commercial technologies	In 2005-2006, NRC-SIMS changed its process for taking IP protection and technology transfer decisions. Before going forward for a provisional patent a patentability assessment or market assessment is now completed. In addition, a patent agent from NRC's Intellectual Property Services Office attends monthly meetings with the Institute to provide technology transfer advice. The Institute is currently undertaking an assessment of its IP portfolio (to be completed July 2006) to determine further changes that should be implemented in the future.
The Institute consider developing a process for funding allocations that is more strategic with some appropriately determined level of internal funding set aside for competitive projects within SIMS with an emphasis on external matching funds.	In 2005-2006, the Institute moved from providing budgets directly to research groups to allocating resources to specific projects that are internally evaluated and ranked. Evaluation criteria are: alignment with NRC-SIMS goals, quality of science, technology transfer, leverage of external funds, identified risks. Starting in 2006-2007, a new process was implemented that reallocates 15% of the Institute's operations budget among projects to reflect Institute priorities to allow projects to end and new projects to begin.
The Institute develop procedures for internal scientific control which combine strong elements of internal and external competition.	In 2005-2006, the Institute put in place a formal project proposal evaluation and ranking process. There is a plan to have an external peer review assessment of the Institute's research

	in the Fall of 2008.

2004-2005 Evaluation of the NRC's Atlantic Initiatives	
Recommendation	Progress Made in 2005-2006
NRC should seek renewed funding for the Technology Clusters Initiatives in Atlantic Canada. The Initiatives in Life Sciences, e-Business/Information Technology and Ocean Technologies should continue to evolve to effectively meet the changing needs of the targeted communities. Based on the ongoing reassessment of the Wireless Systems Initiative, the Institute for Information Technology should continue to adjust both the positioning and value formula (technology focus, resources, etc.) to find the most effective design for NRC's involvement. Representatives from government, associations, academia and other organizations in the communities are active participants in the nascent clusters and are supportive of the cluster concept. Currently, cluster activities are perceived to be dominated by associations and government. The level of involvement by firms in cluster activities varies. Evidence shows that the low level of engagement of firms is a weakness that will need to be addressed as the cluster communities move forward.	NRC used the evidence provided in the evaluation to make a case to the Government of Canada for renewed funding for AI. NRC was successful in this endeavour and the February 2005 federal budget documents included a commitment of "$110 million over five years for the second phase of the NRC's technology-based clusters in Atlantic Canada" noting that "in this second phase, NRC's efforts will increasingly focus on identifying and meeting the innovation needs of local businesses". NRC-IIT's Wireless Systems initiative in Cape Breton did not receive further funding beyond 2004-2005 in its existing configuration. NRC-IIT is no longer in Cape Breton, however stakeholders working with Corporate NRC have identified opportunities for cluster research and are seeking funding.
The renewed NRC Initiatives should specifically seek to broaden the participation of industry in cluster activities. Industry commitment, visible through active involvement, should drive future development of the clusters (e.g., goals, plans and supportive actions).	All NRC Atlantic cluster initiatives have worked to broaden the participation of industry in cluster activities. Some examples are presented below. E-Business and Information Technologies: NRC-IIT participates in a number of activities with the goals of transferring knowledge, facilitating R&D support and collaborations and assisting in alignment of complementary R&D goals and planning. Organizations NRC-IIT is involve with include: Innovation Team New Brunswick; University of New Brunswick Research Network; Knowledge Industry Leadership Network (KILN); eNB; Service New Brunswick); NextNB and Atlantic Angel Network. Life Sciences: A roadmapping exercise to set strategies for the next five years for the Halifax Cluster is being undertaken by the biotechnology industry association, BioNova, to ensure adequate involvement of the industry. NRC-IMB and NRC-IBD are participants in this exercise. Additional engagement of the life sciences industry is being pursued by NRC-IMB and NRC-IBD through a series of bilateral meetings with industrial members of the community, as well as through organizing cluster-related seminars and roundtable discussions which encourage industry participation.

2004-2005 Evaluation of the NRC's Atlantic Initiatives	
Recommendation	Progress Made in 2005-2006
	NRC-IBD and NRC-IMB, with many of the Halifax organizations involved in commercialization of technology, have formed an informal organization which will meet regularly in each other's sites where updates of progress will be given, plus a detailed outlines of the activities of the host site. This is expected to enhance mutual awareness and collaboration. At present the members are academic and government staff, but future meetings will involve members of the business community. Ocean Technology: OceansAdvance, incorporated and led by a private sector board of directors, is leading the transition from an institutionally dominated cluster to an industrially dominated cluster. NRC-IOT is seen as an important supporting agency.
The links between IPFs and their host Institutes should be adjusted as needed to ensure that strategic objectives are met. As the IPFs mature, their contribution to the cluster should be monitored.	The following progress has been made on better linking IPFs and their host Institutes: E-Business and Information Technologies: The operational objectives of the NRC-IIT New Brunswick IPF are adjusted as necessary to support the long-term strategic goals of the Institute while at the same time accommodating short to medium-term operational requirements. For example, NRC-IIT continues to pursue traditional technology incubator tenants but is also interested in working with stakeholders to address other aspects of cluster development and support. The provision of high-quality facilities, laboratories and IT infrastructure to stakeholders through the IPF as well as the use of the IPF to help transfer know-how to various stakeholders in both the public and private sector are also viable objectives for the IPF that will in turn support the Institute's overall strategic goals. The contributions of the IPF to the cluster initiative are being monitored and specific metrics are reported annually through the Institute's annual performance report as well as through specific evaluation reports relating to the Atlantic Initiative itself. Furthermore, broadening the potential client base serves to keep the flow of tenants through the facility at a brisk pace, exposing more of the stakeholder community to the potential benefits of collaboration with NRC-IIT. NRC-IIT strives to maintain the IPF at full capacity. The space available for IPF operations has recently decreased as some IPF floor space was re-allocated to house the Institute Director General's suite of offices following the move of NRC-IIT's Director General position from Ottawa to Fredericton. Life Sciences: To render the NRC-IMB IPF an innovation hub, a model has been developed to deliver the greatest value to the cluster by seeking to capitalize on

2004-2005 Evaluation of the NRC's Atlantic Initiatives	
Recommendation	Progress Made in 2005-2006
	existing and developing relationships between Institute researchers and local industrial collaborators and expand those relationships to involve co-locating at the IPF. Specific AI programs are being implemented to encourage such relationships. Examples include: • a program to fund collaborative and contract research between industrial partners and NRC-IMB researchers; • a program to bring industrial partners to the Institute as speakers; and • a series of bilateral meetings to learn about industry needs and to familiarize the industry with our research capacities. Ocean Technology: At NRC-IOT, the IPF is called the "Cluster Partnership Facility" (CPF) to underscore its role in catalyzing and facilitating cluster development. In the CPF NRC-IOT, NRC-IRAP, and NRC-CISTI support for companies and cluster partners is integrated.
The Initiatives should continue to monitor impacts with regard to AI and adjust programming as required. To facilitate monitoring of impacts, baseline studies should be undertaken.	The National Technology Cluster Secretariat will work with the initiatives to undertake baseline studies, where required, in 2007-2008.
An NRC Action Plan for each Initiative should be developed to provide a framework for NRC activities. These action plans would describe objectives, activities, timelines and performance measures for the scope of NRC's involvement in the development of the clusters. The action plans should be developed by the Institutes, NRC-IRAP and NRC-CISTI as well as any other parts of NRC that would be involved or implicated.	The following progress has been made on developing action plans for each initiative: E-Business and Information Technologies: NRC-IIT developed a Business Case and Operational Plan in June 2005, stemming from the approval of the Memorandum to Cabinet in February 2005. These were approved by NRC's Senior Executive Committee in June 2005 and Treasury Board in August 2005. The Operational Plan sets out objectives, activities, timelines and performance measures for NRC-IIT's activities in the cluster. A Research Plan was also implemented in the Spring of 2006, and a Strategic Plan, encompassing the cluster (New Brunswick) and the remainder of NRC-IIT was also developed at this time. NRC-IIT has entered into an agreement for strategic intelligence services from NRC-CISTI for the remainder of the five year funding period to provide research support for cluster-based IT research and commercialization. Life Sciences: NRC-IMB and NRC-IBD interact regularly with other member of the cluster and are involved in developing a refined cluster strategy for the next five years through the roadmapping process. The completion of the NRC-IMB Action Plan is scheduled to correspond with the

2004-2005 Evaluation of the NRC's Atlantic Initiatives	
Recommendation	Progress Made in 2005-2006
	release of the roadmap later in 2006 in order to fully integrate the NRC-IMB Action Plan with a plan for the Community. In the meantime short-term objectives, milestones, and performance measures have been developed for the specific initiatives that have already been undertaken. In developing the Action Plan, community consultations have been initiated and innovation roundtables organized. In addition, NRC-IMB has engaged recognized external experts to provide training on how to structure and evaluate its activities in a way that would provide maximum, measurable benefit to the cluster. Ocean Technology: An action plan for the Newfoundland and Labrador Ocean Technology Cluster was completed in March 2005. NRC-IRAP, NRC-CISTI and NRC-IOT consulted in the development of the plans to ensure alignment. Effective delivery is achieved by working with clients and partners in an integrated fashion.
As a key player in the Atlantic cluster communities, NRC should facilitate the development of a strategy for each cluster by the cluster members at the community level.	The following progress has been made on developing a strategy for each cluster: E-Business and Information Technologies: NRC-IIT was involved in the development of Fredericton cluster's innovation strategy, called Innovation Fredericton. Enterprise Fredericton was the lead organization in this initiative that brought together key players from the Federal and Provincial governments, the University of New Brunswick and the private sector. Innovation Fredericton, a community-based innovation model, is intended to function as a framework within which education institutions, research and development organizations, the engineering and business communities, and economic development and non-governmental organizations can work together to: • motivate and stimulate innovation and entrepreneurship; • provide effective support to entrepreneurs trying to commercialize innovative products and services; • support retention and attraction of innovative and entrepreneurial organizations, talent and investors; and, • increase and accelerate the transfer of new innovation and technology from research organizations to private sector firms capable of realizing their commercial potential. Enterprise Fredericton is seeking finding and in-kind contributions to execute the

2004-2005 Evaluation of the NRC's Atlantic Initiatives	
Recommendation	Progress Made in 2005-2006
	strategy. Life Sciences: In 2005-2006, NRC-IMB partnered with the Nova Scotia biotechnology industry association, BioNova, as well as InnovaCorp (a provincial economic development organization), Nova Scotia Office of Economic Development, ACOA, and Nova Scotia Business Inc. to facilitate the development of a roadmap for the cluster. Stage one of the process, the Asset Map, has been completed and the request for proposal for stage two, has been prepared. Ocean Technology: NRC has worked closely with the city and the province in the development of their plans. NRC-IOT also facilitates synergistic strategies in the other community development organizations in which it participates.
NRC should establish a coordinating function for the Atlantic Initiatives. This function would be the focal point for coordinating the Initiatives beyond the level of individual Initiatives. The role of such a function could include, but not be limited to, co-ordination across the cluster initiatives as required; setting common approaches (for performance measurement and management, financial tracking and other procedures); identifying, documenting and sharing best practices; and developing and sharing common tools.	In 2005-2006, NRC established a National Technology Cluster Secretariat to provide ongoing strategic support to many of NRC's community innovation initiatives. The Technology Cluster Secretariat is responsible for monitoring technology cluster trends/issues and information sharing and coordination across NRC and with external stakeholders to maximize cluster development. The Technology Cluster Secretariat reports to the Director General, Strategy and Development Branch.
The NRC Action Plan for each cluster should detail the role and contribution of communications in supporting the cluster initiative.	In 2005-2006, NRC Corporate Communications presented and gained approval from NRC's Senior Executive Committee for an overarching strategy and framework to communicate critical elements, developments and activities required for the second phase of NRC's AI Cluster Initiatives. Subsequently, NRC facilities in Atlantic Canada were asked to develop integrated, regional-level communications plans to support the corporate-level communications strategy and framework. Some facilities have completed and submitted their plans to NRC Corporate Communications, while others are still in the process of developing them. The National Technology Clusters Secretariat is working with the I/B/Ps in each community to complete and/or refine these plans.
Accountability requirements for the AI funding should be reviewed and strengthened. Activities and results associated with the incremental AI funding should be tracked and reported separately. Consideration should be given to the appropriateness of targeting the AI funding to specific research projects that are incremental to the a-base funded research and targeted to the needs of the cluster community.	Progress made by each initiative on the review and strengthening of accountability requirements is summarized below: E-Business and Information Technologies: NRC-IIT's performance and accountability framework will be measured using NRC's Research Management Accountability Framework. Within this, three priorities have been selected for 2006-2010:

2004-2005 Evaluation of the NRC's Atlantic Initiatives	
Recommendation	Progress Made in 2005-2006
	Program/Project Management; High Quality People; and Technology Transfer and Commercialization. In addition, cluster success will be measured against the requirements for the Atlantic Initiatives Evaluation. At the research level, accountability for project selection, resources committed and cluster orientation are approved and tracked through a Project Template approval process. Through the Operational Case for funding renewal and Research Plan for New Brunswick, NRC-IIT research and groups have be realigned to focus on priority areas defined by cluster needs, NRC and government policy objectives. Research focus and funding has been aggregated and targeted through the selection of two Strategic Initiatives (cross-Institute large research projects developing leading innovative technologies in two areas cluster priority – privacy/security and broadband), two Priority Projects (aggregation and acceleration of Foundational Research to commercialization in the cluster – in the areas, respectively of Web Services and Mobile/ Usability applications, which are priorities for the cluster). NRC-IIT has is also entered into three collaborative research partnerships with universities and companies as part of ACOA funded AIF cluster projects, and is planning to participate in three more in fiscals 2006-2009. NRC-IIT has developed cost segregation with coding specific to activities and projects for New Brunswick, Ottawa and Gatineau. This initiative was developed in conjunction with finance. Life Sciences: AI funding is being tracked and managed separately from that of other Institute functions. For example, NRC-IBD has had a separate fund centre to deal with NRC-IBD (Atlantic)'s funds since the satellite's inception. However, not all expenses towards the Atlantic Initiative are directly reflected against this fund centre. All expenditures are handled through NRC-IBD finance office in Winnipeg. Along with tracking AI funding separately from A-base funding, NRC-IMB has designated a dedicated science/business position to manage AI cluster activities separately and make sure that initiatives are incremental to A-base funding and geared towards cluster needs. Ocean Technology: NRC-IOT uses a separate fund centre for all AI spending. The only exception is the funding that goes to NRC-IRAP for the NRC-IOT portion of the Young Entrepreneur Program. The activities in the plan are funded from internal orders and results are separately tracked and reported.
Resource allocation should be based on a regular collective challenge process.	Through the newly formed Technology Cluster Secretariat, a formal business planning

2004-2005 Evaluation of the NRC's Atlantic Initiatives	
Recommendation	Progress Made in 2005-2006
In some cases, tracking of AI funding has been inadequate and must be improved.	approach has been launched to ensure that NRC Senior Executive Committee can examine, assess, and discuss individual cluster plans that are consistent in format, are aligned with NRC corporate and cluster portfolio objectives, and outline intended results with an estimated budget. This, in combination with formal evaluation results, provides the basis to SEC for resource allocation decisions. These decisions are typically undertaken in 5 year cycles.
AI funding should be tracked separately from A-base funding.	All Institutes are tracking cluster expenditures separately. Technology Cluster Secretariat: NRC's Strategy and Development Brach has established a separate funds centre for the Technology Cluster Secretariat. E-Business and Information Technologies: All three sections of NRC-IIT (Ottawa, Gatineau and New Brunswick) are tracking expenditures separately. Separate funds centres have been established for each, and separate tracking is conducted for collaborative research across the sites. NRC-IIT has developed cost segregation with coding specific to activities and projects for New Brunswick, Ottawa and Gatineau. This initiative was developed in conjunction with NRC's Finance Branch. Life Sciences: AI funding and expenditures are tracked separately from A-base funding both by NRC-IMB and NRC-IBD. Ocean Technology: NRC-IOT uses a separate fund centre for all AI spending. The only exception is the funding that goes to NRC-IRAP for the NRC-IOT portion of the Young Entrepreneur Program. The activities in the plan are funded from internal orders and results are separately tracked and reported.

Table 3-13: Horizontal Initiatives
NRC is the lead on the Genomics R&D Initiative component of the Canadian Biotechnology Strategy. Performance information on the Initiative can be found on the Canadian Biotechnology Strategy page of TBS' Horizontal Initiatives database at: http://www.tbs-sct.gc.ca/rma/eppi-ibdrp/hrdb-rhbd/cbs-scb/2005-2006_e.asp

Table 3-14: Travel Policies
NRC follows Treasury Board Secretariat's Travel policies and parameters. NRC does not have any Special Travel Authorities.

Table 3-15: Storage Tanks
A letter regarding the status of storage tanks on NRC-owned land was sent to the Minister of the Environment on 28 March 2006.

Appendix A: Awards and Achievements

Abrams, S. NRC-PBI
Nominated Woman of the Year for excellence in science, YWCA

Anthony, S., Meighan, D., Vanbuskirk, M. NRC-CISTI
Agatha Bystram Award for Leadership in Information Management, The Council of Federal Libraries

Anthony, S., Meighan, D., Vanbuskirk, M. NRC-CISTI
Information Management Community Recognition Award, Public Works and Government Services Canada's Information Management Champions Committee

Araujo, J., Auriti, L., Burton., Carignan, S., Dillon, J., Ellis, K., Erdos, R., Gubbels, B., Hui, K., Jones, C., Pinnell E., Smith, S., Stapper, H., Ricciardi, J., Swartz, M. NRC-IAR
International Helicopter Fellowship Award, The American Helicopter Society

Belliveau, L., Savoie, R. NRC-IIT
« Prix Aboiteaux – Recherche et Développement » (for the joint research project SynergiC3), New Brunswick Economic Council

Beraldin, J-A. NRC IIT
eContent Award Italy for best digital content in e-Science, Fondazione Politecnico di Milano & EU MEDICI Framework

Bock, C. NRC-ICPET
W. Lash Miller Award, Electrochemical Society

Bunker, P. NRC-SIMS
Fellow of the Chemical Institute of Canada, Chemical Institute of Canada

Bureau, M. NRC-IMI
Personality of the Year, Quebec Section of the Society of Plastics Engineers

Buriak, J. NRC-NINT
Rutherford Memorial Medal (Chemistry), Royal Society of Canada

Corkum, P. NRC-SIMS
Elected Fellow of the Royal Society, United Kingdom

Corkum, P. NRC-SIMS
Charles H. Townes Award, Optical Society of America

Corkum, P. NRC-SIMS
2005 IEEE/LEOS Quantum Electronics Award, Lasers & Electro-Optics Society (LEOS)

Craigie, J. NRC-IMB
BioNova Research Excellence Award, Nova Scotia Biotechnology & Life Sciences Industry Association

Couturier, C. NRC-IIT
Top 40 under 40, Caldwell Group and Globe and Mail

Daigle, G. NRC-IMS
Helmholtz-Rayleigh Interdisciplinary Silver Medal in Noise and Physical Acoustics, Acoustical Society of America

Decker, J. NRC-INMS
Chairman of Canadian Mirror Working Group to ISO TC229: Nanotechnology for Measurement Standards

Dewdney, P. NRC-HIA
Laurels for Team Achievement Award, International Academy of Astronautics

Dobrowoloski, G. NRC-IMS
Nathaniel H. Sugerman Memorial Award, Society of Vacuum Coaters

Ferrie, A. NRC-PBI
Excellence in Research, Saskatchewan Herb and Spice Association

Hill, B. NRC-IOT
US Coast Guard Meritorious Team Commendation, US Coast Guard.

Hunaidi, O., Wang, A. NRC-IRC
Nova Award for Outstanding Innovation, Construction Innovation Forum (US)

Immarigeon, J-P. NRC-IAR
ASM Canada Council G. MacDonald Award, The American Society for Metals (ASM International)

Kodur, V. NRC-IRC
ASCE Fellow, American Society of Civil Engineers (ASCE)

Koboyashi, M. NRC-IMI
Young Scientist Award, Ultrasonics Conference

Li, H. NRC-ICPET
Exemplary Service Award, American Society for Mechanical Engineering

Lockwood, D. NRC-IMS
Brockhouse Medal for Outstanding Achievement in Condensed Matter and Materials Physics, Canadian Association of Physicists

Lockwood, D. NRC-IMS
Henry Marshall Tory Medal for work on quantum confinement effects in semiconductor nanostructures, Royal Society of Canada

Lounis, Z. NRC-IRC
Award of Excellence, Canadian Society for Civil Engineering and Ontario Minister of Public Infrastructure Renewal

McLaren, J. NRC-INMS
Election to the International Committee for Weights and Measures (CIPM), International Committee for Weights and Measures

Michaud, A. NRC-INMS
Senior Member of the IEEE, Institute of Electrical and Electronics Engineers (IEEE)

Neill, S. NRC-ICPET
Meritorious Service Award, American Society for Mechanical Engineering

Neill, S. NRC-ICPET
Exemplary Service Award, American Society for Mechanical Engineering

Paroli, R. NRC-IRC
ASTM Award of Merit: D08 Committee on Roofing and Waterproofing, American Society for Testing and Materials (ASTM)

Patnaik, P. NRC-IAR
Morris Cohen Award, Materials Integrity & Performance Section of the Canadian Metallurgical Society

Patrick, A., Emig, K., Singer, J., Bruno, E., Marsh, S. NRC-IIT
Access Grid Developers Application Award, Access Grid Retreat Conference

Quilliam, M. NRC-IMB
Harvey W. Wiley Award, Association of Analytical Communities

Ross, N. NRC-IMB
Award of Excellence, Aquaculture Association of Nova Scotia

Song, R. NRC-IIT
Senior Member IEEE Computer Society for his contributions to the information security technology field, IEEE Computer Society

SpringThorpe, T. NRC-IMS
North American Molecular Beam Epitaxy Innovator Award, cosponsored by Veeco Instruments Inc. and the North American Molecular Beam Epitaxy organization

Staples, L. NRC-IMB
Award of Excellence, Aquaculture Association of Nova Scotia

Steele, A. NRC-INMS
Best Paper Award in the Theoretical Metrology Category, National Conference of Standards Laboratories' Annual International Metrology and Measurement Standards Conference

Utracki, L.A. NRC-IMI
Outstanding Service Reward, Polymer Processing Society

Wood, B. NRC-INMS
Appointed as Chairman of the Consultative Committee for Electricity and Magnetism (CCEM) Working Group on Proposed Modification to the International System of Units (WGSI), International Bureau of Weights and Measures

Yan, Y. NRC-IIT
CNRS fellowship, Centre National de la Recherche Scientifique, France

Appendix B: How to Reach Us

Senior Management and Corporate Information

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Planning and Performance Management
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Biotechnology Research Institute (NRC-BRI) – Montréal, QC
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Institute for Biodiagnostics (NRC-IBD) – Winnipeg, MB
Director General: Ian Smith
General Inquiries: (204) 983-7692 http://www.ibd.nrc-cnrc.gc.ca

Institute for Biological Sciences (NRC-IBS) – Ottawa, ON
Director General: Gabrielle Adams
General Inquiries: (613) 993-5812 http://ibs-isb.nrc-cnrc.gc.ca

Institute for Marine Biosciences (NRC-IMB) – Halifax, NS
Director General: Joan Kean-Howie
General Inquiries: (902) 426-8278 http://imb-ibm.nrc-cnrc.gc.ca

Plant Biotechnology Institute (NRC-PBI) – Saskatoon, SK
Director General: Kutty Kartha
General Inquiries: (306) 975-5248 http://pbi-ibp.nrc-cnrc.gc.ca

Under the Direction of the Vice-President Physical Sciences

Herzberg Institute of Astrophysics (NRC-HIA) – Victoria and Penticton, BC
Director General: Gregory G. Fahlman
General Inquiries: (250) 363-0001 http://hia-iha.nrc-cnrc.gc.ca

Institute for Chemical Process and Environmental Technology (NRC-ICPET) – Ottawa, ON
Director General: Don Singleton
General Inquiries: (613) 998-3692 http://icpet-itpce.nrc-cnrc.gc.ca

Institute for Information Technology (NRC-IIT) – Ottawa, ON, Gatineau, QC, Fredericton, NB, Moncton, NB, Saint John, NB, Sydney, Cape Breton
Director General: Christian Couturier
General Inquiries: (506) 444-6132 http://iit-iti.nrc-cnrc.gc.ca

Institute for Microstructural Sciences (NRC-IMS) – Ottawa, ON
Director General: Marie D'Iorio
General Inquiries: (613) 993-4583 http://ims-ism.nrc-cnrc.gc.ca

Institute for National Measurement Standards (NRC-INMS) – Ottawa, ON
Director General: Jim McLaren
General Inquiries: (613) 998-7018 http://inms-ienm.nrc-cnrc.gc.ca

National Institute for Nanotechnology (NRC-NINT) – Edmonton, AB
Director General: Nils Petersen
General Inquiries: (780) 492-8888 http://nint-innt.nrc-cnrc.gc.ca

Steacie Institute for Molecular Sciences (NRC-SIMS) – Ottawa and Chalk River, ON
Director General: Danial Wayner
General Inquiries: (613) 991-5419 http://steacie.nrc-cnrc.gc.ca/

Under the Direction of the Vice-President Engineering

Institute for Aerospace Research (NRC-IAR) – Ottawa, ON and Montréal, QC
Director General: Jerzy Komorowski
General Inquiries: (613) 993-5738 http://iar-ira.nrc-cnrc.gc.ca

Institute for Fuel Cell Innovation (NRC-IFCI) – Vancouver, BC
Director General: Maja Veljkovic
General Inquiries: (604) 221-3099 http://ifci-iipac.nrc-cnrc.gc.ca

Industrial Materials Institute (NRC-IMI) – Longueuil and Saguenay, Quebec
Director General: Blaise Champagne
General Inquiries: (450) 641-5000 http://www.imi.nrc-cnrc.gc.ca

Integrated Manufacturing Technologies Institute (NRC-IMTI) – London, ON
Director General: Georges Salloum
General Inquiries: (519) 430-7092 http://imti-itfi.nrc-cnrc.gc.ca

Institute for Ocean Technology (NRC-IOT) – St. John's, NL
Director General: Mary Williams
General Inquiries: (709) 772-6001 http://iot-ito.nrc-cnrc.gc.ca

Institute for Research in Construction (NRC-IRC) – Ottawa, ON and Regina, SK
Director General: Bob Bowen
General Inquiries: (613) 993-2607 http://irc.nrc-cnrc.gc.ca

Canadian Hydraulics Centre (NRC-CHC)
Executive Director: Etienne Mansard
General Enquiries: (613) 993-2417 http://chc.nrc-cnrc.gc.ca/English/main_e.html

Centre for Surface Transportation Technology (NRC-CSTT) – Ottawa, ON and Vancouver, BC
General Manager: John Coleman
General Inquiries: (613) 998-9639 http://cstt-ctts.nrc-cnrc.gc.ca

Technology and Industry Support

Under the Direction of the Vice-President Technology and Industry Support

Canada Institute for Scientific and Technical Information (NRC-CISTI) – Ottawa, ON with offices across Canada
Director General: Bernard Dumouchel
General Inquiries: 1-800-668-1222 http://cisti-icist.nrc-cnrc.gc.ca

Industrial Research Assistance Program (NRC-IRAP) – Ottawa, ON with offices across Canada
Director General: Tony Rahilly
General Inquiries: 1-877-994-4727 http://irap-pari.nrc-cnrc.gc.ca

Corporate Services

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Administrative Services and Property Management (NRC-ASPM)
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