National Research Council Canada | Conseil national de recherches Canada

NRC · CNRC

Departmental Performance Report

National Research Council Canada

For the period ending 31 March 2007

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Minister of Industry

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Acronyms and Abbreviations

ACURA	Association of Canadian Universities for Research in Astronomy
AIP	Atlantic Investment Partnership
ALMA	Atacama Large Millimeter Array
CBRN	Chemical, Biological, Radiation and Nuclear
cGMP	Current Good Manufacturing Practices
CFHT	Canada-France-Hawaii Telescope
CIHR	Canadian Institutes of Health Research
CRTI	CBRN Research and Technology Initiative
CTI	Competitive Technology Intelligence
DRDC	Defence Research and Development Canada
FCHP	Fuel Cell and Hydrogen Program
FTE	Full-Time Equivalent
GHI	Genomics and Health Initiative
HRM	Human Resources Management
INA	Innovation and Network Advisor
IP	Intellectual Property
IPF	Industry Partnership Facility
ITA	Industrial Technology Advisor
JCMT	James Clerk Maxwell Telescope
LRP	Long Range Plan for Astronomy and Astrophysics
LTRC	Language Technologies Research Center
MSE	Medium-Sized Enterprise
NIC	NRC Information Centre (NRC-CISTI)
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-CB	Commercialization Branch
NRC-CHC	Canadian Hydraulics Centre
NRC-CISTI	Canada Institute for Scientific and Technical Information
NRC-CPFC	Canadian Photonics Fabrication Centre
NRC-CSIR	Centre for Sustainable Infrastructure Research
NRC-CSTT	Centre for Surface Transportation Technology
NRC-GTL	Gas Turbine Laboratory
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
OTEC	Ocean Technology Enterprise Centre
R&D	Research and Development
RMAF	Results-based Management and Accountability Framework
S&T	Science and Technology
SMEs	Small- and Medium-sized Enterprises
SOFC	Solid Oxide Fuel Cells
STM	Scientific, Technical and Medical
TBS	Treasury Board of Canada Secretariat
TIS	Technology and Industry Support
TRIUMF	Tri-University Meson Facility

Section I – Agency Overview

Minister's Message

I am pleased to present the National Research Council's *Departmental Performance Report* for 2006–07.

My goal as Minister of Industry, and one of the top priorities of Canada's New Government, is to ensure we maintain a strong economic environment — one that allows Canadians to prosper in the global economy. We are seeing great changes in the international marketplace. New trade agreements, rapidly advancing technologies and the emergence of developing countries are all contributing to today's business environment. Canada needs to keep pace.

Part of my mandate is to help make Canadians more productive and competitive. We want our industries to continue to thrive and all Canadians to continue to enjoy one of the highest standards of living in the world.

For this to happen, the government is committed to maintaining a fair, efficient and competitive marketplace — one that encourages investment, sets the stage for greater productivity, and facilitates innovation. We are relying on market forces to a greater extent, regulating only when it is absolutely necessary. Our policies have helped turn research into new products and business processes. In addition, we are making efforts to increase awareness of sustainability practices among Canadian industry, emphasizing the social, environmental and economic benefits they bring.

The Department and the Industry Portfolio have made progress on a wide range of issues this past year, most notably in the areas of telecommunications, science and practical research, manufacturing, small business, consumer protection, patents and copyrights, tourism and economic development.

The Industry Portfolio is composed of Industry Canada and 10 other agencies, Crown corporations and quasi-judicial bodies. These organizations collectively advance Canada's industrial, scientific and economic development, and help ensure that we remain competitive in the global marketplace.

We have accomplished much this year. Using *Advantage Canada* — the government's long-term economic plan — as our roadmap, we have made great strides toward many of our most important goals. We will continue to focus on these goals to support the conditions for a strong economy — an environment that Canadians expect and deserve.

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Jim Prentice
Minister of Industry

Management Representation Statement

I submit, for tabling in Parliament, the 2006–2007 Departmental Performance Report for the 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 2006–2007 Estimates: Reports on Plans and Priorities Departmental Performance Reports*:

- It adheres to the specific reporting requirements outlined in the Treasury Board Secretariat guidance;
- It is based on the department's approved Strategic Outcome(s) and Program Activity Architecture that were approved by the Treasury Board;
- It presents 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.

Dr. Pierre Coulombe
President

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

Raison d'être

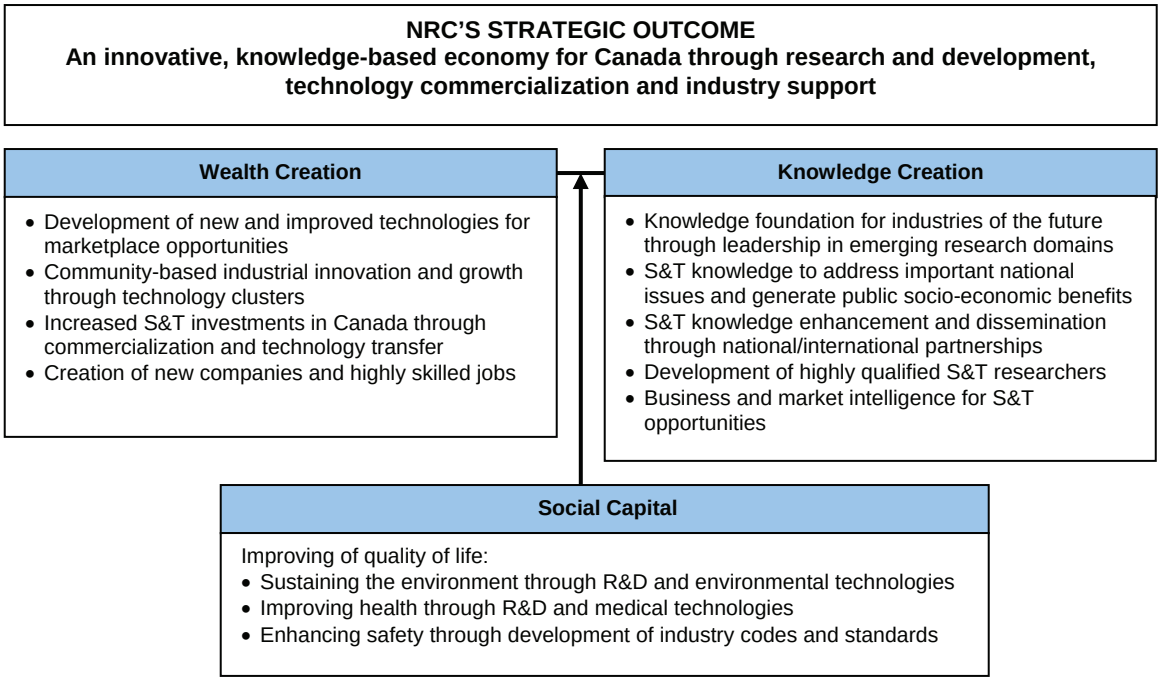
NRC is the Government of Canada's leading resource for Science and Technology (S&T) development. NRC's primary business is:

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

NRC Benefits to Canadians

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

Figure 1-1: NRC Benefits to Canadians



NRC's Business and Management Priorities for 2006-2007 – Status on Performance

Table 1-1: NRC Resources for 2006-2007

Financial Resources ($ millions)		
Planned	Total Authorities	Actual Spending
714.1	844.7	742.1
Human Resources (Full-Time Equivalents – FTEs)		
Planned	Actual	Difference
4,033	4,191	158

Figure 1-2 highlights the plans and priorities identified in the 2006-2007 to 2008-2009 period (as identified in NRC's 2006-2007 Report on Plans and Priorities (RPP)).

Figure 1-2: Strategic Framework for NRC Plans and Priorities

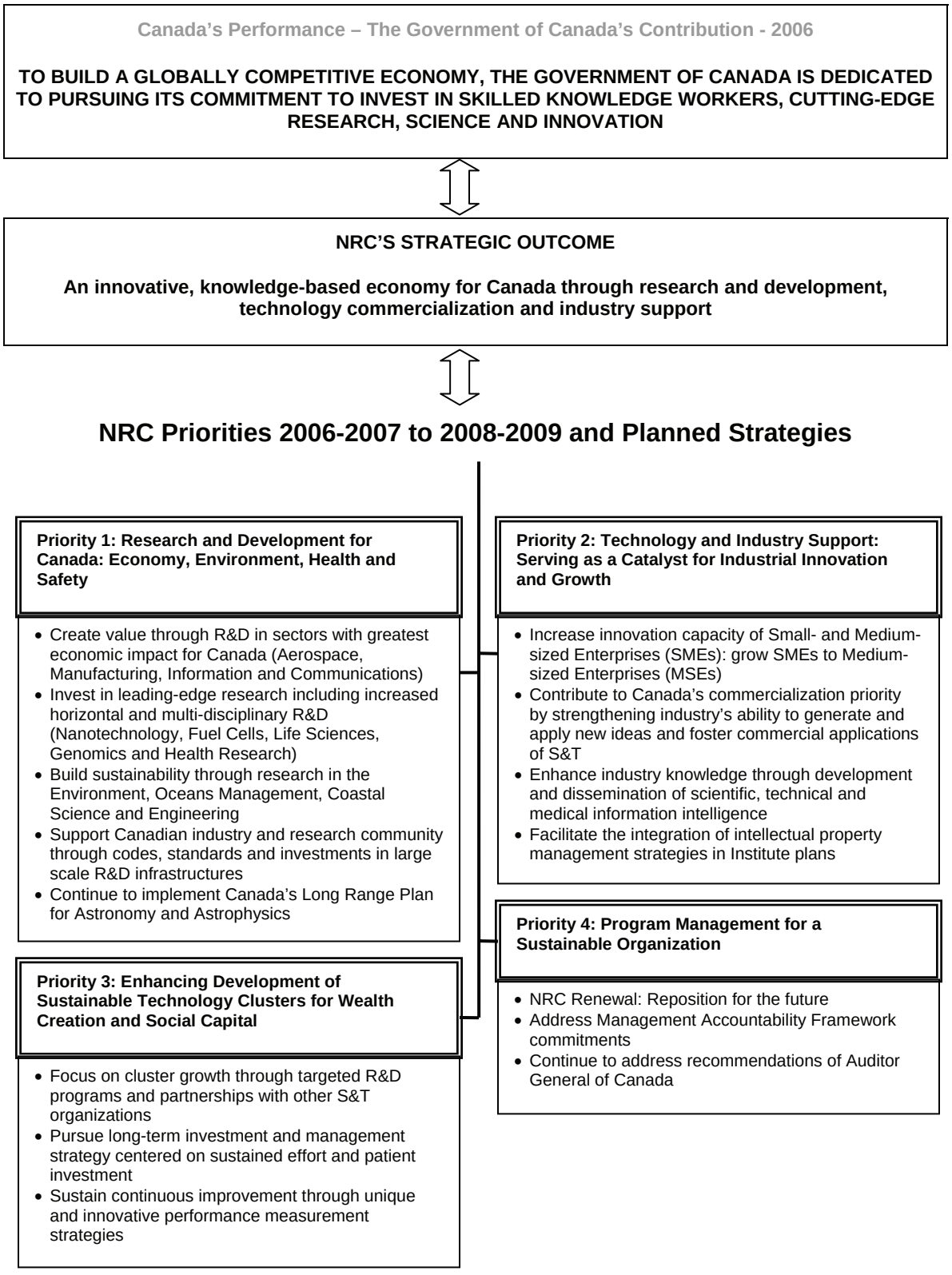


Table 1-2: NRC Business and Management Priorities for 2006-2007

NRC's Strategic Outcome: An innovative, knowledge-based economy for Canada through research and development, technology commercialization and industry support		Performance Status*	2006-2007	
Priorities and Type	Program Activity/ Expected results		Planned spending ($ millions)	Actual spending ($ millions)
Priority no. 1 Research and Development for Canada: Economy, Environment, Health & Safety Type: ongoing	Program Activity: Research and Development Expected results: • 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	390.66	380.8
Priority no. 2 Technology and Industry Support: Serving as a Catalyst for Industrial Innovation and Growth Type: ongoing	Program Activity: Technology and Industry Support Expected Results: • Creation of new technology-based companies • Access to new technologies for Canadian firms through patents and licensing • Enhanced innovation capacity of firms • Improved dissemination of knowledge • Supporting the Canadian Industry	successfully met	179.22	182.2
Priority no. 3 Enhancing Development of Sustainable Technology Clusters for Wealth Creation and Social Capital Type: previously committed	Program Activity: Research and Development and Technology and Industry Support Expected Results: • Competitive research and development base for cluster development • Innovative firms and deep talent pools in regions across Canada • Community ownership of cluster initiatives – local leadership and strategies • Improved quality of life through increased productivity and new technology-based solutions in health, for industry, the environment, etc.	successfully met	75.89	75.2

NRC's Strategic Outcome: An innovative, knowledge-based economy for Canada through research and development, technology commercialization and industry support		Performance Status*	2006-2007	
Priorities and Type	Program Activity/ Expected results		Planned spending ($ millions)	Actual spending ($ millions)
Priority no. 4 Program Management for a Sustainable Organization Type: ongoing	Program Activity: Research and Development** and Technology and Industry Support**	successfully met	68.28	103.9
	Expected Results: • 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			

* It should be noted that the Expected Results identified in the 2005-2006 RPP apply to a three-year period and therefore not all listed results have been successfully met in the 2005-2006 fiscal year; however, overall the priority is considered "successfully met".

** 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.

NRC's Operating Environment

NRC has:

- A 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.
- A core strength of over 4,000 talented and dedicated people, 19 research institutes, 15 industrial partnership facilities, the Industrial Research Assistance Program (NRC-IRAP), the Canada Institute for Scientific and Technical Information (NRC-CISTI) and two technology centres.
- The ability to help companies move discoveries in the laboratory towards the development, prototyping and commercialization of these ideas and technologies for the global marketplace.
- The skills to manage research towards short- and long-term specific goals.
- The capability to bring together multi-disciplinary research teams to tackle issues of national importance.
- The ability to put together national programs for delivery in regions across the country.

National S&T Infrastructure

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

Ownership, Management and Maintenance of Capital Assets

Responsible for its own highly technical and complex operations, NRC manages 175 buildings totalling approximately 517,406 square metres of space.

Funding

NRC is funded through 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.

Context

Internal Factors

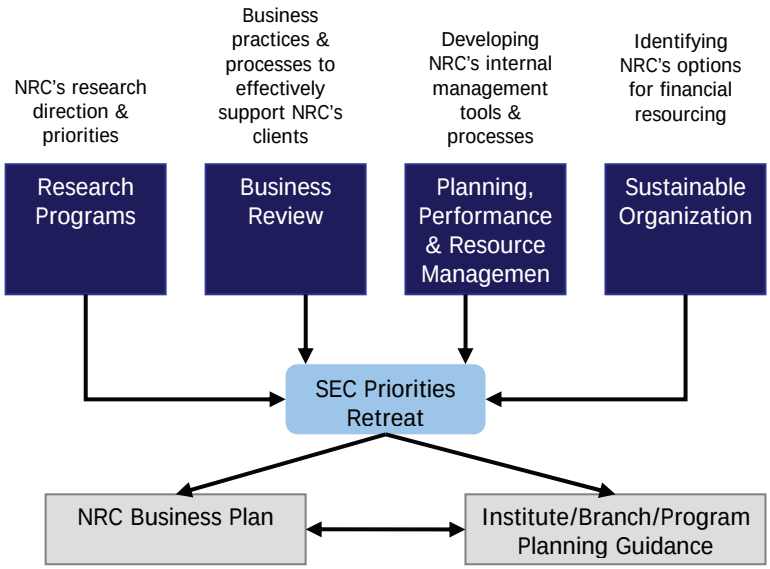
NRC New Strategic Direction: Building a Roadmap for Future Sustainability

The 2006-2007 fiscal year began with the official release of NRC's new strategy, *Science At Work for Canada: A Strategy for the National Research Council, 2006-2011*, to staff and key stakeholders. Shortly thereafter, the organization put in place four major implementation initiatives composed of cross-functional teams with the requisite subject-matter expertise:

1. Research Programs
2. Business Review
3. Planning, Performance & Resource Management (PPRM)
4. Sustainable Organization

As illustrated below, these implementation teams made recommendations that were presented to the Senior Executive Committee (SEC) in fall 2006 as part of NRC's annual priority setting exercise. Decisions reached by SEC served as key inputs into the development of NRC's inaugural corporate business plan, a draft of which was developed by the end of fiscal year 2006-2007. A final version of the NRC corporate business plan is expected to be in place by early 2007-2008.

Figure 1-3: NRC's Strategy Implementation Process



The following summarizes the implementation teams' key recommendations that were approved by SEC:

Research Programs

NRC will focus its R&D efforts in nine key industrial sectors: Aerospace, Agriculture, Automotive, Chemicals, Construction, Electronic Instruments, Information and Communications Technologies, Manufacturing & Materials and Bio-Pharma. These sectors were identified through significant quantitative and qualitative analysis, as well as through consultation with internal and external stakeholders that took place throughout 2006-2007. Each NRC research Vice-President (VP) was assigned accountability for one or more sectors. Beginning in 2007-2008, Directors General (DGs) will be appointed to lead the development of plans and objectives for each sector.

In addition, NRC will work closely with other government departments, industry and universities to address national priorities in health & wellness, sustainable energy and the environment. As a first major initiative, NRC is committed, in cooperation with Agriculture and Agri-food Canada, to putting in place a national program in bioproducts which will address those latter two national priorities. An accountable VP, a lead DG and a working group have been assigned to the development of the National Bioproducts Program and a target date of Q1 2008-2009 has been established for full launch of the National Bioproducts Program.

NRC has also identified an opportunity to establish a second national program in Fuel Cells & Hydrogen, building on an existing cross-NRC program. A target of 2009-2010 has been set as the formal launch date for the program, although planning work will begin in earnest in 2007-2008.

Business Review

NRC's strategy calls for increased outreach and collaboration with clients and key innovation system players. The Business Review implementation initiative was put in place to identify existing

NRC business processes and practices (as they relate to clients, collaborators and other third parties) and recommend changes to strengthen NRC's client orientation.

As a result of this initiative, NRC is committed to placing greater emphasis on leveraging client relationships across all institutes, branches and programs with the aim of maximizing the value NRC can deliver to clients. To this end, an IT-based client relationship management system was identified as a priority and NRC has put in place the financial and non-financial resources required to implement such a system.

NRC will also provide training for staff who interact with clients, strengthening its commercialization capabilities and redesigning some internal business processes, such as the process for reviewing/approving contractual agreements. In collaboration with other parts of the organization, the Vice-President Technology and Industry Support put forward a business case at the end of 2006-2007 identifying the resources required to address these recommendations.

Planning, Performance & Resource Management (PPRM)

The PPRM initiative focused on establishing and enhancing management practices at NRC. The implementation achievements in 2006-2007 included:

(a) Establishing a new organizational-wide business planning process. This process was developed and piloted throughout 2006-2007 and integrates strategic and operational planning, performance measurement, risk management and resource management (financial, human, physical assets). All NRC institutes/branches/programs will be charged with developing three-year rolling business plans.

(b) Establishing a new performance management framework to support NRC's strategy. In 2006-2007, development of a performance management framework based on the Balanced Scorecard began. A draft, with proposed measures, was completed by the end of the fiscal year. Further consultation is expected to take place in 2007-2008 before the framework is finalized and fully implemented across NRC.

(c) Establishing a new Program Activity Architecture (PAA) for NRC. In Q4 2006-2007, SEC approved a new PAA for NRC which will be used for all business planning activities going forward. The PAA will be reviewed by Treasury Board Secretariat (TBS) in 2007-2008. A business case is expected to be put forward in Q1 2007-2008 detailing the implementation requirements.

Sustainable Organization

The Sustainable Organization implementation initiative was aimed at identifing options for securing NRC's long-term financial sustainability. The project team made a number of initial recommendations that were presented to SEC and finalized by the end of the fiscal year. Specifically, NRC will:

1. Focus the organization's R&D priorities in defined areas: key sectors, national priorities, regional/community innovation (including technology clusters) and areas of national mandate.
2. Identify internal operational efficiencies.
3. Work increasingly with collaborators.

4. Identify areas requiring future investments and funding.

External Factors

Economic Context – Canadian economic performance continued to be solid in 2006 with a real GDP growth rate of 2.7%, a slight deceleration from the 2.9% of the preceding year. [1]

In 2006, employment creation in Canada remained solid, it increased by 1.9% with 314.6 thousand net new jobs created, more than in each of the two preceding years. The bulk of the increase consisted of full time jobs (2.3%) with part-time jobs accounting for just 0.4%. The unemployment rate in Canada reached historic lows, reaching an average of 6.3% in 2006, down from 6.8% in 2005. The unemployment rate closed the year at 6.1% in December 2006.[2]

The Canadian dollar appreciated against the U.S. dollar a further 6.8% in 2006 while the appreciation rates against the euro and the pound were 6.0% and 5.6%, respectively. This appreciation reflected partly a rise in the commodity prices. Despite currency appreciation, Canadian exports of goods increased slightly in 2006 (1.2%).[3]

Personal expenditure on consumer goods and services advanced 4.1% in 2006, its best performance since 1997. The strength of personal spending comes as no surprise as both labour income and corporate profits increased by approximately 6%.[4]

Venture capital investment across Canada in the first quarter of 2007 showed very strong growth on both a year-over-year and quarter-over-quarter basis, totalling $598 million. This represents a 62% increase over the $370 million invested during Q1 2006, and is also 16% above the $517 million invested in the previous quarter (Q4 2006). The growth in venture capital investment was strongest in Ontario, where $302 million was invested, more than double the $149 million invested in Q1 2006. [5]

Biopharmaceutical and other life science investments increased in Q1 2007 with 25 companies receiving $206 million in new venture capital (up 44% from the $143 million in Q1 2006). Venture investment in environmental “clean” technologies also showed strong growth during the quarter, with $35 million invested in nine companies, compared to $15 million invested in seven transactions during Q1 2006.[6]

NRC’s Link to the Government of Canada Outcome Areas – 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 Outcome Areas as outlined below:

[1] Canada’s State of Trade: Trade and Investment Update 2007. 7 June 2007, http://www.dfait-maeci.gc.ca/eet/pdf/07-1989-DFAIT-en.pdf
[2] Ibid.
[3] Ibid.
[4] Ibid.
[5] Canada’s Venture Capital Industry in Q1 2007, Thomson Financial. 2007, http://www.canadavc.com/files/Q12007OverviewFrench.pdf.
[6] Ibid.

- *An Innovative and Knowledge-based Economy:* A better life for all Canadians is the highest priority for the federal government[7] 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.
- *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 human health and medical devices; 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.

[7] Budget Speech (May 2006), The Honourable Jim Flaherty, Minister of Finance, http://www.fin.gc.ca/budget06/pdf/speeche.pdf

Section II – Analysis of Program Activities

This section provides an overview of NRC's Program Activities (based on NRC's Program Activity Architecture established in 2004) and how they contributed in 2006-2007 to the organization's priorities and strategic outcome - *an innovative, knowledge-based economy for Canada through research and development, technology commercialization and industry support*.

Overview of Program Activities

NRC Program Activities are structured along two business lines (Research and Development, and Technology and Industry Support). These 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

<table>
<tr><td colspan="6">NRC's Strategic Outcome:
An innovative, knowledge-based economy for Canada through research and development, technology commercialization and industry support</td></tr>
<tr><td colspan="3">Research and Development</td><td colspan="3">Technology and Industry Support</td></tr>
<tr><td colspan="3">Description:
Includes research programs, technology development initiatives and 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 a significant impact.</td><td colspan="3">Description:
Includes dissemination of scientific, technical and medical information; provision of innovation assistance and engineering and technology-based facilities; contributions 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.</td></tr>
<tr><td colspan="3">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.</td><td colspan="3">Objectives:
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.
3) Provide efficient, client-focused services that enhance NRC's effectiveness as an integrated S&T organization.</td></tr>
<tr><td colspan="3">2006-2007 Financial Resources ($ millions)</td><td colspan="3">2006-2007 Financial Resources ($ millions)</td></tr>
<tr><td>Planned</td><td>Total Authorities</td><td>Actual</td><td>Planned</td><td>Total Authorities</td><td>Actual</td></tr>
<tr><td>508.9</td><td>613.0</td><td>530.1</td><td>205.2</td><td>231.7</td><td>212.0</td></tr>
<tr><td colspan="3">2006-2007 Human Resources (FTEs)</td><td colspan="3">2006-2007 Human Resources (FTEs)</td></tr>
<tr><td>Planned</td><td>Actual</td><td>Difference</td><td>Planned</td><td>Actual</td><td>Difference</td></tr>
<tr><td>3,148</td><td>3,191</td><td>43</td><td>885</td><td>999</td><td>114</td></tr>
</table>

NRC Programs

In 2006-2007, in addition to its specific Research and Development and Technology Industry Support activities, NRC focused its efforts on programs that also support important Canadian priorities. Many of these are multi-disciplinary, cross-organizational initiatives that encompass a number of NRC entities (e.g., research institutes, laboratories, centres, facilities, programs and services). These collaborative programs address the Government's priorities on optimizing its S&T investments and expanding its value and reach. Examples of NRC's programming efforts in these areas can be found in the following "program spotlights" sections:

- The Genomics and Health Initiative (NRC-GHI) – See page 23
- The Industrial Research Assistance Program (NRC-IRAP) – See page 31
- The Canada Institute for Scientific and Technical Information (NRC-CISTI) – See page 33

NRC's Overall Performance for 2006-2007

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

Performance Indicators (as identified in the 2006-2007 RPP)	• Technology transfer (patents, licences) • Spin offs/spin ins/new ventures • 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

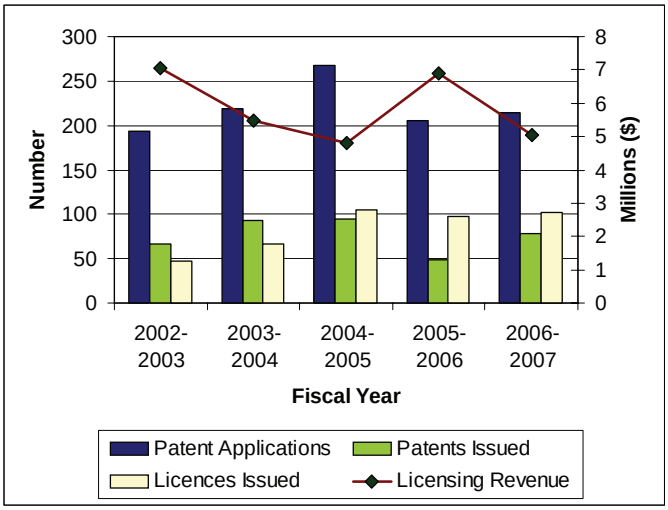
The performance indicators that do not change year-over-year are not reported on annually.

In 2006-2007, the Research and Development portfolio contributed to areas that are recognized as priorities for Canada through its core strengths: national research institutes and innovation activities 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 and the research community through codes and standards, access to national facilities and stewardship of Canada's "big science" facilities remained a foundation to global marketplace access and international R&D alliances. The portfolio continued to develop new technologies leading to commercialization opportunities for Canadian industry.

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 2006-2007, NRC applied for 215 new patents and secured 78 patents from applications made in previous years. Forty-five percent of these were issued in the U.S. – an Organization for Economic Cooperation and Development (OECD) recognized measure of competitiveness. Based on a 2003 benchmarking study of best practices in IP management, NRC is changing its approach by screening disclosures early; 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 102 new licence agreements in 2006-2007 and IP licensing revenue was $5.0 million (see Figure 2-1).

Figure 2-1: NRC IP Portfolio (2002-2007)



Source: NRC Performance Information Database, 2006

Just over $2.3 million of IP revenue in 2006-2007 was attributed directly to the Meningitis-C vaccine developed by the NRC Institute for Biological Sciences (NRC-IBS) and $1.1 million of revenue from hardware and software development can be attributed to the NRC Institute for Information Technology (NRC-IIT).

Some examples of NRC technology licensed to industry in 2006-2007 include:

- In December 2006, Canadian-based Nstein Technologies Inc. announced the signing of a 10-year technology licence agreement, and a three-year collaborative research agreement related to the use of NRC's "Factor" text mining technology. Developed at NRC-IIT, "Factor" is a leading-edge search tool that will give Nstein a competitive advantage in the text analytics market. This technology and research partnership, valued at over $7.5 million, is one of the largest commercialization deals signed by NRC-IIT.
- The NRC Institute for National Measurement Standards (NRC-INMS), a world leader in the field of radiation therapy dosimetry, continues to benefit from the licensing of its Monte Carlo Code for Electron Beam Calculations to MDS Nordion. The Canadian company sold its oncology software portfolio to an international firm, Nucletron® B.V. in 2003 with a five-year licence extension to December 2012.
- The NRC Institute for Microstructural Sciences (NRC-IMS) has been active in the development of OLEDs (organic light-emitting devices) in collaboration with Canadian and international partners. One such partnership with National Tsing Hua University in Taiwan led to the synthesis of a new organic compound by NTHU that was fabricated into commercially promising devices by NRC-IMS resulting in a patent application in Canada, the U.S. and Taiwan.

When NRC develops a technology with particularly strong market potential and there is no Canadian receptor capacity identified, entirely new companies may be created to commercialize the technology. These new companies create innovative products and services for the global marketplace and new jobs for Canadians. In 2006-2007, NRC launched one new company bringing the total of new companies created since 1995 to 68 accounting for approximately 604 full-time

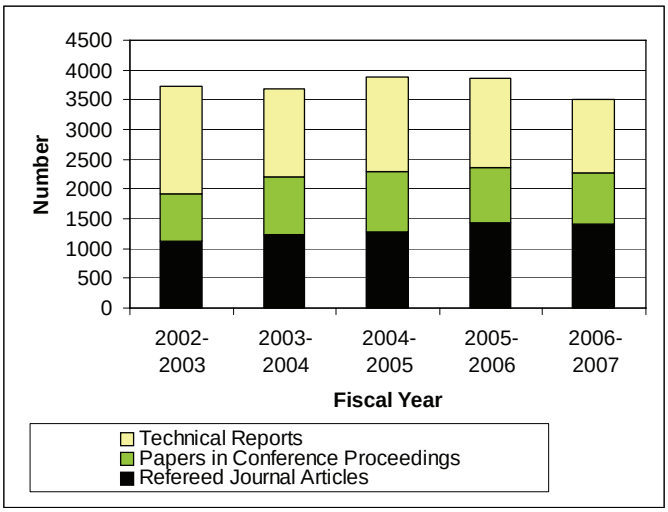
jobs and an estimated $437 million in cumulative investment, a 6% decrease from last year[8]. In 2006, investment from all sources into NRC new companies was $63 million.

Company created in 2006-2007:

- *Kent Imaging Inc.* – based on NRC patented technology, Kent Imaging has developed a camera system that will enable emergency doctors and surgeons to survey injured or reconstructed tissue to determine its state of health. Taking "viability" pictures of tissue using the camera system can supply information to doctors on the amount of blood and oxygen reaching it and thus indicating its potential for survival. These are crucial pieces of information that will help with critical decision-making during initial injury assessment, surgery, or post-operative recovery.

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 2006-2007, researchers published 1,403 articles in refereed journals. NRC researchers also presented 870 papers at S&T conferences and produced 1,239 technical reports for clients (see Figure 2-2).

Figure 2-2: NRC Publications (2002-2007)



Source: NRC Performance Information Database, 2006

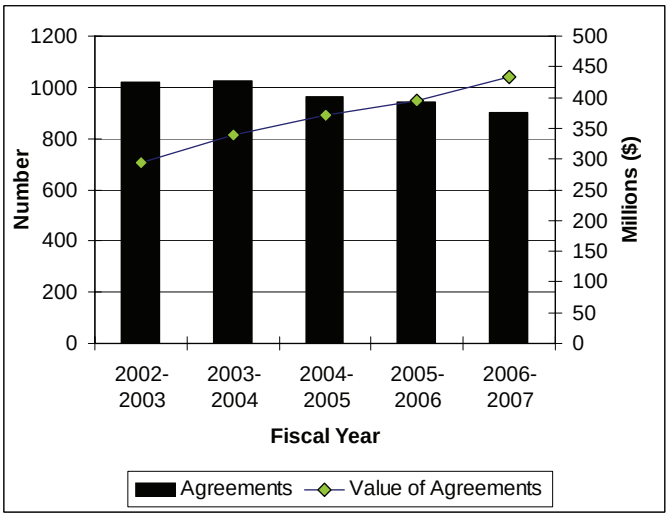
NRC's research excellence is also evident in the involvement of its researchers in multi-researcher networks and centres of excellence as well as the number of externally funded, peer-reviewed research grant proposals. In 2006-2007, NRC researchers participated in 110 research networks, held 217 positions on editorial boards of scientific journals and were appointed to 499 adjunct professorships in Canadian universities. One hundred and seventy four grants provided NRC researchers and their partners with $36 million, over the lifetime of the projects. Examples of external awards received by NRC researchers in the last year can be found in Section IV – Awards and Achievements.

[8] Adventus Research Inc., *Economic Impact of National Research Council Canada Spin-Off Companies 2007 Survey*, February 25, 2007.

National leadership in R&D and innovation is demonstrated by the participation of NRC researchers on 593 national committees and by the 206 conferences and workshops organized by the institutes.

In 2006-2007, NRC signed 361 new formal collaborative research agreements with Canadian partners worth a total of $149 million. The total value over the lifetime of these agreements grew to $434 million (see Figure 2-3). The number and value of collaborative agreements signed during a year are indicators that foretell increased research activity. NRC's Canadian partners invest 1.48 dollars for every dollar NRC invests.

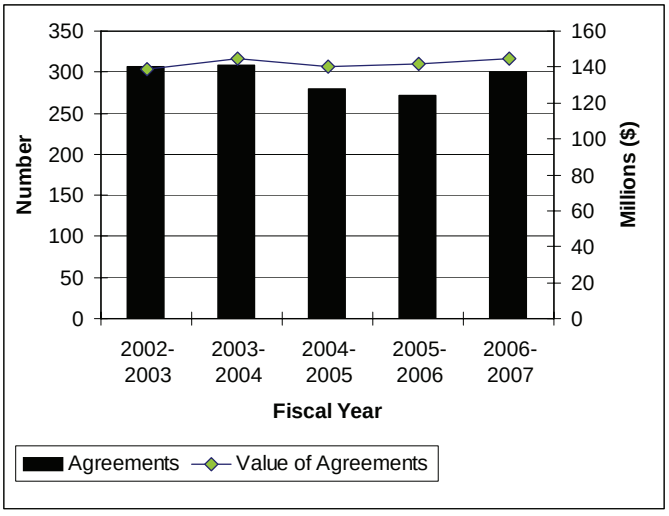
Figure 2-3: Canadian Collaborations (2002-2007)



Source: NRC Performance Information Database, 2006

Participation in international projects and consortia exposes Canadian students, researchers and companies to the best-in-the-world capabilities. In 2006-2007, NRC signed 99 new formal collaborative research agreements with international partners worth $41 million. The total number of active international collaborative agreements is similar to last year's number (see Figure 2-4), with a total value over the lifetime of the agreements of close to $145 million. NRC's international partners invest 5.3 dollars for every dollar NRC invests.

Figure 2-4: International Collaborations (2002-2007)



Source: NRC Performance Information Database, 2006

Strategy: Creating value through R&D in sectors with the greatest economic impact for Canada

Facilitate technology advantage for next generation aerospace industry – Fiscal year 2006-2007 was the second year the NRC-Aerospace Manufacturing Technology Centre (NRC-AMTC) occupied its new building in Montreal. Over the past year, it has embarked on a $9 million technology demonstration project with funding support from Canada Economic Development for

Quebec Regions. This project is focused on the manufacture of aircraft major structural components from composite materials. The strategic objective of the project is to facilitate the development in Canada of a tier 2 major subcomponent integrator within the aerospace supply chain.

In 2006-2007, the NRC Gas Turbine Laboratory (NRC-GTL), working with Industry Canada's Aerospace and Defence Branch established a national network for the development of a technology roadmap and technology demonstrator capability in aerospace diagnostics, prognostics and health management. The network, consisting of the major Canadian Original Equipment Manufacturers (Bell Helicopter, Pratt & Whitney and Bombardier), with government, university and small- and medium-sized enterprises (SMEs) from the aerospace community, identified priority technology needs in 14 projects and developed the funding solutions to proceed with two new projects this past year. The network links all of the innovation system components in this domain, for the first time. Approximately 80 participants worked together to advance the process for teaming. A national steering committee directs the activities through regular meetings and a website. The establishment of the network and successful implementation of team–led innovation across the community is of benefit to the Canadian aerospace community and will form a working model for the development of a Technology Roadmap in Combustion–focused Computational Fluid Dynamics.

The NRC Institute for Aerospace Research (NRC-IAR) and GE Aviation, in partnership with Aéroports de Montréal, built a new facility to conduct icing certification tests on large engines. Construction of the facility, located at the end of Montreal's Mirabel International Airport runway, was completed in February 2007. This new NRC facility, along with existing facilities in Ottawa, could result in Canada becoming the icing certification centre of excellence for the world.

Position Canadian industry as a key player in advanced manufacturing – In 2006-2007, the NRC Industrial Materials Institute (NRC-IMI) continued to focus on the processing and forming industries. Much progress was made in biomaterials, metal foaming technologies, aluminium forming, environmental membranes, natural fibre composites and biodegradable polymers. Sectors served included automotive, medical devices, aerospace, and general manufacturing in metals and plastics. NRC-IMI, for example, achieved the development of an integrated mathematical model for the hydroforming of structural aluminium automobile components. They also developed innovative aluminium rear suspension components for automobiles to be manufactured in 2010-12. The design was optimized for the use of robotic welding equipment in their assembly.

At the NRC-AMTC some projects were able to deliver significant results quickly for General Motors and Bombardier. A collaborative project with General Motors Canada (GMC) on High Speed Grinding of Steel and Nodular Cast Iron has achieved higher material removal rates than has ever been obtained before. This has significant impact on the productivity and reduction of the manufacturing costs of crankshafts and camshafts at GMC. In collaboration with Bombardier Aerospace (BA), NRC-AMTC has developed the first in the world high accuracy positioning system for fuselage panel riveting using collaborative robots. Novel methods of calibration and the use of metrology-in-the loop for the positioning control improved the accuracy of positioning the part on a panel. The impact of the implementation of this system will be a 50 to 75 % reduction of production costs of fuselage components according to a Bombardier forecast and, as a secondary benefit, the reduction of occupational diseases due to obviating the need to have a human operator close to a

noise-filled workspace environment. According to the client, this breakthrough will result in ensuring that the production of fuselage panels for most BA aircraft will remain in Montreal rather than being shipped outside Canada.

In collaboration with industrial, university and government partners, the NRC Integrated Manufacturing Technologies Institute (NRC-IMTI) held six meetings with current and potential members in three of their Special Interest Groups: Precision Freeform Fabrication Technologies (PFFTech), Precision Micro Fabrication Technologies (PMFTech) and Reconfigurable and Flexible Manufacturing Technologies (RFMTech).

The NRC Institute for Chemical Process and Environmental Technology (NRC-ICPET) continued to focus on two major research thrusts: energy-oriented processes and solution-driven materials within a sustainable framework. The Institute worked with Environment Canada, Industry Canada, Natural Resources Canada and Five Winds International on the refinement of SAFT V2, a tool that can help researchers in companies determine the overall sustainability of proposed research approaches and industrial processes. As part of the evaluation, the tool was applied to several bioproducts projects currently underway at NRC. NRC-ICPET continued to build on its fuel cell research capabilities, creating new materials that outperform current commercial membranes in cost and performance. In the oil sands area, NRC-ICPET developed and renewed industrial collaborations with the Canadian Oil Sands Network for Research and Development (CONRAD) and Syncrude. These industrial collaborations complement a significant investment from other government departments in NRC-ICPET's research program which brings a fundamental chemical science approach to oil sands processing and significantly reduces the energy and process requirements associated with synthetic crude oil production.

The NRC Institute for Fuel Cell Innovation's (NRC-IFCI) R&D program in 2006-2007 aimed at advancing fundamental fuel cell science and technology applications and accelerating the adaptation and commercialization of these technologies. To contribute to these objectives, the Institute assembled a multi-disciplinary team of research scientists, engineers, and technical staff, with recognized expertise in fuel cell and hydrogen technologies. NRC-IFCI had several critical achievements in 2006-2007 in advanced materials and manufacturing which will reduce the cost of Proton Exchange Membrane Fuel Cells (PEMFC) and Solid Oxide Fuel Cells (SOFC) materials and enable the Canadian Fuel Cell and Hydrogen industry to mass produce fuel cell materials:

- Using the internally developed Reactive Spray Deposition Technology, NRC-IFCI developed high-performance membrane electrode assemblies (MEA) with low loading nano-platinum catalyst layers. Through the development of an advanced catalyst coating membrane (CCM) technique and the use of an internally developed vacuum table, NRC-IFCI achieved a significant performance improvement, better than many commercial baseline MEAs. These achievements position NRC-IFCI as a leader in the development of high performance MEAs.
- Cost-effective processes for SOFC fabrication were developed, which are scaleable for high-volume manufacturing. The production of nanopowders for SOFC using axial injection plasma spray, the fabrication of thin film SOFC materials, and the deposition of thin SOFC electrolytes with high gas tightness enable the production of SOFCs at lower cost and temperatures, vastly improving overall performance and commercial viability.
- Technical concepts for a 2-layer structure air cathode, with a hydrophobic diffusion layer (GDL) and a catalyst impregnated mesh layer, as opposed to the commercially available 4-

layer air cathode were developed. The new cathode with high performance and high stability has resulted in several patents, which have become the core technology for one of NRC-IFCI's local cluster partners. This technology has enabled the industrial client to develop their first fuel cell product in a cost effective manner.

Reduce industry risks and costs of working on next generation information and communications technology – In 2006-2007, NRC-IMS and NRC-IIT continued to be involved in developing next-generation capabilities in information and communications technology. NRC-IIT's areas of research priority are Knowledge from Data, People-Oriented Systems and eBusiness and include research in data mining, cybersecurity and machine translation.

The Language Technologies Research Centre (LTRC) located on the main campus of the Université du Québec en Outaouais (UQO) unites researchers from the partnering organizations (Translation Bureau of Canada, UQO, Industry Canada and NRC-IIT) as well as the language industry association AILIA, UQO's technology transfer office (BLUM) and NRC-IRAP. The group has now achieved a full complement of researchers together with graduate students and post-doctoral fellows. Three technologies in the group's portfolio which present commercialization potential include: TransCheck (a translation error-detection software), Barçah (terminometry support software) and PORTAGE (statistical machine translation). In December 2006, NRC-IIT signed its first industrial cooperation agreement for the use of some components of PORTAGE technology to enhance existing translation support products.

In 2006-2007, NRC-IIT's research contract for the use of PORTAGE in the multimillion dollar GALE (Global Autonomous Language Exploitation) research program was renewed for a second year. GALE, sponsored by the U.S. Government's Defense Advanced Research Projects Agency (DARPA), has the goal of making foreign language (Arabic and Chinese) speech and text accessible to English monolingual people, particularly in military settings. NRC-IIT is the only Canadian R&D participant in GALE, the largest project in the world in natural language processing. Participation will build future returns; in working with the best in the world, NRC-IIT is involved in developing technologies that will eventually be espoused by Canadian industry and allow Canada to be competitive in this emerging area. The PORTAGE technology was also instrumental in fostering a new research project called SMART, which targets the development of new techniques in machine translation in collaboration with a consortium of European laboratories.

NRC-IMS is anticipating the importance to the Information and Communications Technologies (ICT) sector of working at the nano and quantum scales. NRC-IMS's work with self-assembled quantum dots lays the foundation for future sources of single and entangled photons with application to secure information transfer using fibre-based communication channels. In another effort, NRC-IMS led a three-nation team to optically detect a fraction of the electron's charge, a research breakthrough published in the prestigious journal *Nature Physics*.

An NRC-IMS team demonstrated the first functional electronic circuit composed of three single electron spins localized in a field-effect transistor, and as a result was invited to become a partner in QuantumWorks, a new Innovation Platform based at the University of Waterloo, funded by the Natural Sciences and Engineering Research Council of Canada (NSERC), that links Canadian researchers with industrial and government agency partners to lead Canada into the nano and quantum technological revolution.

In 2006, researchers from three NRC institutes demonstrated the first silicon photonic wire evanescent field (PWEF) sensor element. Given that optical PWEF sensor elements can occupy an onchip space less than a few tens of micrometers across, this technology lends itself to integration in multiplexed sensor arrays – an essential requirement for a practical molecular sensing technology. It is also compatible with standard silicon fabrication processes and therefore has the potential to provide a manufacturable solution, filling a need for label-free sensor arrays in genomics and proteomics based diagnostics and research, as well as for drug screening in the pharmaceutical industry.

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

Supporting Canada's leadership in fuel cells – The Fuel Cell and Hydrogen Program mobilizes fuel cell expertise and research strength from a network of NRC research institutes across Canada, including the Institute for Fuel Cell Innovation (NRC-IFCI) in Vancouver, which is the flagship for this program. A total of $6.2 million over five years (from 2003-2004 to 2007-2008) was allocated to NRC for its Fuel Cell and Hydrogen Program - a key horizontal initiative. In 2006-2007, seven PEMFCs and SOFCs were funded with $1.1 million at five NRC institutes. With matching institute contributions, total value of the program was $4.5 million. In 2006-2007, 35 scientific papers were published in refereed journals and two patent applications filed. NRC's research accomplishments from this cross-NRC program have been recognized in the academic community, and NRC is an important partner in research network proposals submitted to Natural Sciences and Engineering Research Council of Canada (NSERC) for SOFCs, Hydrogen and PEMFC research. Fundamental research and strong competencies developed in the program have now resulted in establishing an international reputation for NRC-IFCI in hydrogen and fuel cell research resulting in five signed collaborative projects with Canada's top fuel cell companies as well as Nissan of Japan. Continuing work with Ballard Power Systems, Hyteon Inc., Tekion Inc. and Northwest Mettech is bringing this technology closer to the marketplace. These "spin-off" projects directly resulted from the research done within the program. Program funding will be up for renewal in 2008-2009.

Through research results and competencies developed as the key institute within this program, NRC-IFCI has played a pivotal role in supporting the growth of the Canadian hydrogen and fuel cell industry. During the five years since the establishment of the institute the British Columbia hydrogen and fuel cell cluster has grown from just a few companies to a dynamic emerging cluster. Today, British Columbia is widely considered to be the centre of one of the world's most advanced clusters of companies and organizations focused on fuel cell and hydrogen technologies. NRC-IFCI has worked on 19 collaborative industry projects, was invited to participate in the "EU Framework Program 6" group involving 18 European organizations, and was chosen as one of three organizations worldwide for Japan's New Energy and Industrial Technology Development Organization (NEDO) international fuel cell program.

Increase synergies in bioproducts – As part of its new strategy, NRC will be implementing a series of national programs to address Canadian priorities in health and wellness, environment, and sustainable energy. These programs will be "outcome-focused", involving multi-disciplines from across NRC and other research and commercial organizations (including other government

departments and industry players). In April 2007, it was announced that the Vice-President Life Sciences will be responsible for the implementation of the first national program in bioproducts. During 2006-2007, work accomplished in establishing this new program included aligning stakeholders (including Agriculture and Agri-Food Canada who is co-leading the implementation of this program), identifying expertise and capacity at NRC which will be relevant to program objectives and scoping out a potential focus. Developing bioproducts will increase the value of Canadian virgin resources and find higher value applications for low-value streams such as agricultural and forestry wastes, municipal solid waste, residual organics and other under-utilized organic resources, as well as have an impact on two Canadian priorities: environment and sustainable engery.

Support health for Canadians: Vaccines, immunology and neurodegenerative diseases – Building on the success of its Meningitis C vaccine for people of all ages, NRC-IBS continued to address important public health concerns through the application of neuro- and glycosciences to reduce the impact of age-related and infectious diseases by, among other things, developing an effective vaccine against Alzheimer's disease and conducting research on brain repair solutions through a new neuroglycobiology program. In 2006-2007, new immunology and neuroglycobiology laboratory facilities were put in place and staffing was added to grow these new activities. NRC-IBS continued to collaborate with Dow AgroSciences to reduce the load of food-borne pathogens in animals thereby contributing to the safety of the world's meat supply.

Support National Security – NRC is the lead on one Chemical Biological Radiological Nuclear (CBRN) Research Technology Initiative project and participates in three others. In partnership with the NRC Steacie Institute for Molecular Sciences (NRC-SIMS), Laval University, Health Canada and Defence Research and Development Canada Suffield, NRC-IMI designs and fabricates plastic-based substrates and devices for micro-magnetic manipulation for detection purposes. The NRC-SIMS portion of the project involves the design of nano-material architectures for the detection and capture of pathogens. The technology has a wide range of applications contributing to the speed and efficiency of diagnostics for both therapeutic and security purposes.

Safety is a major concern and governments devote a lot of effort to this area. NRC-IMI makes use of horizontal programs to develop materials technologies for safety applications, in particular the chemical or biochemical detection of pathogens, in collaboration with the Canadian Government (National Defence, Genome Canada, GHI-3, and other NRC institutes), research centres and universities, and other major players in this area.

NRC-IMI takes part in many projects in collaboration with Canada's National Defence, including:

- Development of smart detectors for diagnosing and predicting the condition of aerospace structures over time. Networks of ultrasonic piezoelectric detectors were incorporated into aerospace structures manufactured with various materials. The use of these detectors has shown that faults in the structure can be detected at a great distance, on flat as well as curved surfaces.
- Anti-corrosive coatings for increasing the useful life of aircraft structures.
- Development of an aluminium anode coating, obtained either by thermal deposition or low-temperature deposition, offering protection against corrosion under stress and against corrosion fatigue for aluminium alloys, while preserving their initial mechanical properties.

- Development of a microfluidic manipulation system in collaboration with several research groups at Laval University that can concentrate and filter DNA targets for the detection of bacteriological agents (anthrax).
- Demonstration of the capture and detection by magnetic confinement of DNA targets at a concentration of less than 1000 copies/ml.
- Development of a manufacturing process for nanometric polymer fibres with certain properties such as electrical conductivity, thermochromism, etc.

In 2006-2007, the NRC Centre for Surface Transportation Technology (NRC-CSTT) played a key role in assisting the Canadian Armed Forces with the Leopard 2 Tank System Integration. The Armed Forces decided to make greater use of tracked vehicles, such as the Leopard 2 Tank to improve troop protection, vehicle mobility and defence capability while removing the risks associated with the use of local roadways. The new Leopard tanks however lacked many of the Canadian communications, situational awareness and command and control systems. Under very tight timelines to accommodate the desire to ship completed and operational tanks to Afghanistan, NRC-CSTT played an integral part of the team to utilize its unique approach to design and integration using a virtual design environment. In addition, NRC-CSTT assisted in the evaluation and option analysis of using varied tank crew cooling systems to combat the expected hot temperatures of operating a 66-ton metal tank in desert locations. The contribution of NRC-CSTT staff to this work served to significantly reduce the number of soldier lives lost to hazards of moving on the roadways in and around Kandahar, Afghanistan. It represents a contribution by NRC to saving Canadian lives and raising Canada's ability to function effectively in this threatening theatre.

Participate in international collaborations in a non-traditional role – In the fall of 2006 NRC, in collaboration with the Centre de recherche et de restauration des musées de France (C2RMF), announced the completion of the most important scientific study ever done of Leonardo da Vinci's *Mona Lisa.* The two-year collaboration involved the use of a number of cutting-edge technologies to examine the painting's physical properties. Among these was a three dimensional (3D) colour laser scanner designed and built by NRC which was taken to Paris to scan the painting. The scanner is capable of scanning 3D images at a depth resolution of 10 micro-meters, or about 1/10 the diameter of a human hair. The 3D model was used to document and precisely measure the shape of the wooden panel on which the *Mona Lisa* is painted, to examine features of the composition and the craquelure of the paint and to study the painting's state of conservation. The technology has an extensive range of museum and heritage applications and has been widely recognised.

Integrate nanotechnology research and innovation – To build its competencies and leverage its resources and knowledge, NRC is developing a horizontal nanotechnology initiative (NRCNano) that will increase the integration of expertise across the NRC as well as facilitate collaborations with external partners, including other government departments, universities and industry. The program will work in concert with a nascent nanotechnology network growing around the National Institute for Nanotechnology (NINT) in which specialized nano centres across Canada are linking together to share information and enable collaborative ventures.

One illustrative example of the way in which NRC institutes already work collaboratively in nanotechnology is the research being performed by three NRC institutes in the area of single

walled carbon nanotubes (SWNT). NRC-SIMS has world-leading capabilities in making and functionalizing high purity SWNT; NRC-IMI brings its knowledge and operational experience in blending and setting process parameters for unique blends of polymers and additives; and NRC-IAR contributes its materials testing capabilities and in-depth understanding of the future needs of the Canadian aerospace industry.

Program Spotlights - NRC Genomics and Health Initiatives (NRC-GHI): Address key social and economic challenges through integrated Genomics and Health Research

Description: NRC conducts over half of all biotechnology research performed by the federal government and is a major contributor to important advances in genomics, proteomics and health-related research through the NRC Genomics and Health Initiative (NRC-GHI). NRC-GHI was established in 1999 to strengthen NRC's capabilities in genome and health sciences, 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 six large-scale and diverse biotechnology research programs, supported by three technology platforms (DNA Microarray, DNA Sequencing and Proteomics). NRC-GHI is NRC's flagship horizontal life sciences initiative and currently involves ten NRC institutes and more than 400 personnel.

Plans: In 2006-2007, NRC-GHI will be entering the second year of its third phase of research activity. The initiative will continue to focus its efforts on six research 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. NRC completed an evaluation of NRC-GHI in 2005-2006. The results of this study will feed into a broader evaluation of the interdepartmental Genomics R&D Initiative in 2005-2006 and 2006-2007. NRC is leading this evaluation on behalf of the six participating departments.

Recognized Program Management and Governance Process: NRC is committed to effective research program management practices and has integrated lessons learned from the first two phases of NRC-GHI to refine the competitive program selection process for the third phase. An external Expert Panel with industry representation has reviewed all program proposals for quality and relevance. NRC uses selection criteria that favour integration of research capabilities across 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; progress is evaluated quarterly as well as annually. A new comprehensive governance model for NRC-GHI was assembled for the third phase to ensure that various accountabilities and responsibilities are clarified and understood. Approved by NRC Senior Executive Committee, the NRC-GHI governance structure is being promoted as a model for horizontal programs within NRC.

2006-2007 Financial Resources

Planned	Total Authorities*	Actual**
$11.00 million	$11.57 million	$10.94 million

*$6 million of annual funding is subject to renewal. Current approval covers the period of April 2006 to March 2008.
**Participating NRC institutes are required to provide matching funds, bringing the total value of the GHI in 2006-2007 to $24.6 million.

Planned Results (from 2006-2007 RPP):
NRC-GHI has five primary goals:

- Create a knowledge base in genomics that will contribute to Canada's competitiveness in the 21st

Century.

- Create and use new genomics or health-related technologies to support Canadian industrial sectors such as aquaculture, agriculture, environment and health.
- Support and participate in the development of sectoral, national and international genomics and health-related innovation networks.
- Foster increased cooperation and integration in genomics and health-related research and innovation programs across NRC and with public and private sector partners.
- Foster excellence in horizontal research program management and accountability.

2006-2007 Performance:

The NRC-GHI Expert Panel conducted a formal mid-term review of NRC-GHI research programs in 2006-2007 and recommendations were made to the Vice-President Life Sciences regarding changes to research objectives and direction as programs plans were established for the final year of GHI-3 (2007-2008).

On behalf of the six participating departments, NRC led an evaluation of the interdepartmental Genomics R&D Initiative in 2006-2007 and revised the Results-based Management and Accountability Framework (RMAF) for the Initiative. The process to renew NRC-GHI into a fourth phase (GHI-4) was launched in 2006-2007. NRC research teams were encouraged to demonstrate their ability to integrate research and technology disciplines in order to drive commercially relevant advances in cutting-edge areas of genome and health-sciences, while ensuring alignment with the new NRC strategy. Decisions on which Letters of Intent would be moving forward for full proposal development were made and new investments are being considered in areas that focus on cerebrovasular and infectious diseases.

Scientific Output

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

- 125 papers in refereed journals
- 68 papers in peer reviewed conference proceedings
- 106 invited external presentations at conferences and symposiums

Examples of impacts from selected NRC-GHI programs include:

- *Aquatic Animal Disease Management:* The genome of *Aeromonas salmonicida* subsp. salmonicida has been annotated and submitted to GenBank. The program's first live attenuated vaccine candidates were tested in Atlantic salmon. Three promising vaccine candidates were identified and proved to show significant protection during trials. Discussions are already underway with several potential industrial partners, interested in bringing these vaccines to market.
- *Functional Genomics of Brassica Seed Development and Metabolism:* The cell biological bases for thinner and lighter seed coat in yellow-seeded canola have been determined, providing a structural handle/target for further manipulation. Researchers have now shown that the development of seed coat is temporally and intimately related to embryo development in canola. The functionality of a promoter to a specific layer of the seed coat is now established, offering a tool for manipulating this part of the seed coat. This manipulation technique could lead to the development of more durable and productive Canola crops – a matter of growing importance in the global search for cost-effective and efficient renewable fuels.
- *Personalized medicine for Cancer*: Work with glioblastoma cell models and clinical samples has resulted not only in the identification of biomarkers for the vasculature of brain tumors, but also in the identification of a family of markers with anti-angiogenic activities: the Insulin-Like Growth Factor Binding Protein (IGFBP) family. This program has filed a provisional patent that encompasses the utilization of these molecules and related peptides as anti-angiogenic

molecules with potential applications in the treatment of cancer.

Economic Benefits

Patents and licences in 2006-2007:

- 10 patent applications
- 10 patents granted / active
- 3 licenses granted
- $17,000 revenue generated from licensing
- 3 material transfer agreements signed

In addition, NRC-GHI programs have profited from several collaborations and service contracts with external partners:

- The *Personalized Medicine for Cancer* program is involved in two-year collaborative research agreement with Helix BioPharma. This collaboration arose out of the isolation and initial preliminary characterization of a lung carcinoma specific antibody, AFAI, in NRC-GHI Phases 1 and 2. Under this agreement, work on further characterization of the antigen recognized by AFAI is underway at NRC-IBS.
- Under the *Managing Chronic Cardiovascular Disease* program, the NRC Institute for Biodiagnostics (NRC-IBD) has commenced a three-year collaborative research and development project with Siemens Canada Ltd. - Medical Systems Division, to discover new magnetic resonance imaging (MRI) techniques and technologies. NRC-IBD is one of only two sites in the world that have been selected by Siemens to perform collaborative research and development in this new multi-transmitter MRI field at 3 Tesla. Under the terms of the agreement, both parties will commit both personnel and technology resources, and Siemens will pay NRC-IBD a cash contribution of $320,000 to help fund certain components of the project.

Citizenship Engagement

NRC-GHI employees participate in a wide-range of Citizen Engagement activities. The following are a few examples:

- The National Research Council Plant Biotechnology Institute (NRC-PBI) was invited to participate in Western Regional Consultations on the creation of a National Canadian Grains Strategy (November 2006).
- The National Research Council Institute for Marine Biosciences (NRC-IMB) hosted its annual Discovery Day. Students from local schools visited NRC-IMB and participated in hands-on activities that demonstrated our technologies, research and expertise. GHI research from the *Aquatic Animal Disease Management* program was also featured during this event.
- Throughout 2006-2007 NRC-GHI continued to participate in and provide info packages for a variety of external conferences, shows, career fairs, etc. (i.e., University of British Columbia Faculty of Land and Food Systems Career Fair, BIO 2006).

Participating NRC Research Institutes (2006-2007): NRC-BRI, NRC-IIT, NRC-IBD, NRC-IMB, NRC-IBS, NRC-PBI, NRC-SIMS, NRC-IMI, NINT, NRC-IMS.

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

Strategy: Build sustainability in the Environment, Oceans Management, Coastal Science and Engineering

Continue to support Canada's commitment to reduce greenhouse gas emissions and improve the environment[9] – NRC works with other government departments in the delivery of interdepartmental programs on clean energy and climate change. Its main contributions are in two areas: hydrogen and fuel cell R&D and in the new national program on bioproducts. In partnership with an industry collaborator NRC-IFCI developed technology for generating hydrogen on demand. The device generates 99.99% pure hydrogen and can easily be started and stopped by "throwing a switch". Its purity makes it ideal as a fuel for proton exchange membrane fuel cells and for providing gases to laboratories and industrial processes. Safety is a key concern regarding hydrogen use especially when it must be stored in large quantities or transported using public transportation infrastructure. As this newly developed device generates hydrogen on demand and does not need storage capacity it addresses these safety issues very effectively. Owing to its devices key features and scalability, NRC anticipates the technology will be used in a number of applications ranging from portable electronics, back-up power systems and possibly automobiles. This technology is currently being commercialized and will bring us one step closer to reaping the environmental benefits of hydrogen as a fuel.

NRC-IBS scientists designed an enzymatic process to effectively degrade pectin from hemp fibres, for which a patent application has been filed. Through a licensing agreement, a Vancouver company, Naturally Advanced Technologies, plans to commercialize the process and produce soft, white hemp clothing that can compete with cotton. Unlike cotton, hemp can be grown without pesticides and herbicides and rain provides enough irrigation. It absorbs carbon dioxide five times more efficiently than the same acreage of forest, so it can also help fight the greenhouse effect. NRC-IBS developments in hemp fibre processing will contribute to a sustainable value-added Canadian agricultural industry permitting Canadian farmers to compete in the lucrative world market for fabrics. Cotton cannot be grown in Canada, which has limited the potential for a Canadian presence in this market.

The NRC Biotechnology Research Institute (NRC-BRI) was co-responsible for a major environment technology demonstration project in 2006, consisting of testing groundwater (bio) remediation technologies, including nanotechnologies. Total budget for the project was $1.56 million. The technology is being transferred to a Canadian company.

In Montreal, a former industrial and municipal waste dumping site, Technoparc, represented a hazard to aquatic life in the St-Lawrence River because of the toxic leachate and oils seeping in the river, was converted into a high tech park. NRC-BRI, through a technology platform set-up in collaboration the province of Quebec, City of Montreal, Environment Canada, Economic Development Canada, and environmental industries has been involved in the testing of technologies, evaluation of industrial technology performance and assessment, management of the whole project, making links with stakeholders (private and public) and in communications with the

[9] 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.

public. NRC- BRI is further developing this project which should lead to a large scale technology demonstration project, estimated at $4.5 million for 2007-2008. When completed, this site could be redeveloped by the “Société du Havre de Montréal”.

The NRC Institute for Research in Construction (NRC-IRC) developed an Integrated Indoor Air Quality Model software program that provides an integrated view to indoor environment pollution issues including pollutants (vapours and particles), sources (indoor and outdoor), and fate/transport mechanisms that affect levels of indoor pollutants. This software supports the construction (and related) industries in reducing emissions from materials, reducing ventilation loads, and improving material selection.

The NRC Canadian Centre for Housing Technology (NRC-CCHT) performed a number of projects largely aimed at assessing innovative construction products and systems and reducing energy consumption and associated green house gas (GHG) production. During 2006-2007, the Centre was the focus of a number of joint research and strategic projects. The following are highlights:

- In-situ Performance of Two-stage Gas Furnace. Following the mid versus high efficiency furnace project, the evaluation of a two-stage gas furnace continued for several weeks in different conditions.
- RAD Zone Control System for Houses. An innovative controller for individual room control on a forced air system was assessed over two seasons.
- Thermostat Setback and Set-forward. A detailed study and report were completed, documenting the effects of thermostat set-back in winter and set-forward in summer.
- StART–Hydrogen Electrolyzer. A prototype of a hydrogen generator based on the electrolysis of water was deployed at NRC-CCHT in a proof-of-concept experiment, which saw the generation of hydrogen on site in the Test House. This hydrogen was then blended with the domestic natural gas stream and subsequently burned to recover the energy as heat.
- Window Glazing Technologies – Comparison of High and Low solar Heat Gain Low-e Technologies. A window experiment involving whole-house performance comparisons of low-e coatings with differing solar heat gain ran successfully for four weeks of winter testing and four weeks of summer testing. The analysis and modeling is now complete.

Build sustainability through oceans science – The reliable performance of technology in the marine environment is of commercial value to all ocean industries. The evaluation of that performance is an important tool in assuring the safety of people, the security of assets and the protection of the ocean environment. These concerns have led to increasing demand for cost-effective systems to harvest ocean renewable energy. In 2006-2007, researchers at the NRC Institute for Ocean Technology (NRC-IOT) researchers began testing novel technologies at model scale, utilizing the Institute’s Offshore Engineering Basin. The results will be used to launch field trials of full-scale systems, giving Canadian developers an international advantage in this emerging sector.

Canada’s energy industry also benefited from performance evaluation of flexible risers for offshore oil and gas operations. These risers are often subject to vortex induced vibrations. NRC-IOT carried out physical tests to measure riser response behaviour in currents. That information was used to develop a numerical model for dynamic flexible riser vibrations. This capability to model

and assess deep-water technologies is benefiting the east coast offshore industry and is being delivered in turn to the international market by Canadian SMEs.

The Ocean Sciences Technology Partnership (OSTP) in 2006-2007 succeeded, through extensive consultation sessions across Canada, in capturing the links between ocean science researchers and technology innovators from government, industry, academia, coastal communities and regional organizations. These relationships strengthened national linkages between regional networks, information sharing and awareness building, leveraging of funds, building technology commercialization demonstrations, partnerships and joint ventures. As had been envisaged, OSTP represented a national voice for the ocean technology community in 2006-2007. In addition to preparation of their "Smart Oceans Strategy", OSTP developed an Internet-based directory that provides information on Canada's suppliers of ocean related research and technology solutions.

NRC-IRAP staff played a role in the evolution of OSTP, serving as an advisor to the Board and helping guide the development of the deliverables through participation in Board meetings and interactions with the OSTP project manager and individual board members. Additional information is available from the website: http://www.ostp-psto.ca

Strategy: Support Canadian industry and research community through codes, standards and investments in R&D infrastructures

Harmonize international measurement standards –NRC-INMS is Canada's national metrology institute (NMI), determining physical standards and methods of measurement that impact directly on the ability of Canadian firms to trade internationally by reducing non-tariff trade barriers. NRC-INMS's work helps assure global market access to Canadian industry. NRC-INMS has now completed the implementation of a quality management system (QMS) for all its calibration and measurement services, meeting the requirements of ISO/IEC 17025, the international quality standard for calibration and testing laboratories. A QMS is a mandatory requirement for full participation in the activities related to the Mutual Recognition Arrangement (MRA) facilitated by the Comité international des poids et mesures (CIPM).

An ongoing challenge for NRC-INMS has been addressing measurement barriers to innovation arising from rapidly developing technologies such as nanotechnology and biotechnology, while maintaining essential calibration and measurement capability in more traditional areas. NRC-INMS has significantly expanded its response to the need for measurement standards for nanotechnology, a priority established in its Strategic Plan 2002-2007. NRC-INMS is playing a leadership role at the national and international level in activities promoting the harmonized development of regulatory and measurement standards that will underpin nanotechnology innovation. The Institute's new measurement and calibration capabilities will support nanoscience activities in other NRC institutes, as well as commercialization opportunities resulting from this work. In biotechnology, NRC-INMS collaborated with the Canadian Food Inspection Agency to produce a set of reference materials (RMs) for genetically modified (GM) canola that will be used to verify the accuracy of chemical analyses used to determine GM content. These RMs, the first of their kind world-wide, have attracted attention from other NMIs and, more importantly, from the major ag-biotech companies which will be able to use these reference materials to address marketing and labelling issues.

Objective-based model construction codes - clarity, flexibility and uniformity – NRC-IRC's new objective based codes, launched in 2005, facilitate the evaluation of alternative products and design solutions, making the Canadian construction codes more accommodating to innovation, renovations to existing buildings and international trade. To inform code users of the most significant of these changes in the 2005 Codes, NRC-IRC in coordination with the provinces and territories, delivered approximately 40 seminars over fiscal years 2005-2006 and 2006-2007 reaching 6,200 participants. A further 1000 stakeholders were engaged by additional presentations covering specific codes-related topics. In August 2006 the codes were made available on CD-ROM.

Leverage "Big Science" partnerships – TRIUMF (Tri-University Meson Facility) is one of the country's key investments in major science infrastructure. It provides world-class facilities for research in sub-atomic physics, nuclear physics, nuclear astrophysics, life sciences and condensed matter physics and encourages the transfer of technology developed at the laboratory to the marketplace. NRC provides funding for the facility on behalf of the Government of Canada via a contribution agreement and oversees the federal investment. TRIUMF has completed the second year of its 2005-2010 Plan, with five-year funding totalling $222 million. Canada Foundation for Innovation (CFI) funding was obtained by the Canadian university community for the ATLAS Data Hub, which will be located at TRIUMF. CFI funding was also obtained by the Canadian university community for the TRIUMF M20 beamline.

Strategy: Continue to implement Canada's Long Range Plan for Astronomy and Astrophysics

The NRC Herzberg Institute of Astrophysics (NRC-HIA) plays a unique role in the implementation of Canada's Long Range Plan for Astronomy (LRP), a national strategy for astronomy research – Astronomy has evolved from a predominantly national enterprise into an international activity with regional or limited partnerships.

The top-priority LRP project, ALMA, is now well into facility construction and considerable effort has been focused on defining the Canadian role in the operational phase, which is scheduled to begin ramping up in fiscal year 2008–2009. NRC-HIA delivered on its commitment to produce receiver cartridges as part of the Canadian contribution to the project. Following rigorous acceptance testing, the first two Band 3 receiver cartridges were delivered by NRC-HIA to the ALMA integration centre in Virginia in 2006-2007. As a result of NRC's work, a contract has been awarded for the production of further cartridges to NanowaveTechnologies Inc. of Ontario.

The TMT project is in the design development phase. NRC-HIA makes an in-kind contribution based on the scientific and engineering expertise resident at the Institute. NRC-HIA staff continued to hold key roles in the TMT project effort, including leading instrumentation development activities and defining the high-level requirements for construction. The TMT Structure Manager continues to work with Dynamic Structures Ltd., the industrial partner on the project.

NRC-HIA's SKA work has shifted with the release of the SKA reference design. The European Union has designated the SKA as a global project of interest to Europe, opening the door to non-European participation in the FP7 funding program. NRC-HIA is currently participating in a funding application endorsed by 27 international organizations.

In 2006-2007, NRC signed an agreement with the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia to seek funds to become a partner in the Mileura International Radio Array (MIRA), a demonstration project linked to the SKA. MIRA is a science-capable pathfinder telescope to be built in Western Australia over the next decade. NRC-HIA is working with CSIRO's Australia Telescope National Facility on specifications, implementation and respective roles in the project.

The LRP also recognized the importance of computational resources and access to vast amounts of data. The NRC-HIA Canadian Astronomy Data Centre (CADC) allows researchers access to the data collected by telescopes. In 2006-2007, improvements resulted in raw Gemini datasets being made available to users within 15 minutes of acquisition. In 2006, more than 106 external refereed publications acknowledged use of the CADC, an indication that the use of archive data is becoming an integral part of astronomical research, both through the augmentation of original observations and through novel data-mining applications that are entirely dependent on the availability of such records. NRC-HIA is widely recognized for expertise in this domain.

Digital expertise at NRC-HIA is currently being used to build a $20 million supercomputer that will be the heart of the U.S. National Radio Astronomy Observatory's Very Large Array radio telescope in New Mexico. When complete in 2010, this will be the largest correlator in the world. The backbone components of the system are several large circuit boards which have challenged state-of-the-art printed-circuit board design and fabrication methods. The boards were designed and produced at NRC-HIA.

Implementation of Phase II of the LRP

An evaluation of NRC-HIA's contributions to the LRP has been released. The evaluation, which involved over 50 interviews with peers and stakeholders in Canada and internationally, confirmed the relevance of NRC-HIA's contribution to the implementation of the LRP to university and industrial stakeholders and underlined the lack of duplication between NRC and university efforts.

The Institute continues to focus its attention on all elements of the Long Range Plan (LRP) for Canadian Astronomy. LRP Phase I funding was received for the period 2002-2003 to 2006-2007, Phase II planning is currently under development.

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

Performance Indicators (as identified in the 2006-2007 RPP)

- Technology transfer
- Knowledge dissemination
- Highly-qualified personnel to Canada
- Client success
- Economic, social and environmental impact

The performance indicators that do not change year-over-year are not reported on annually.

In support of the Government of Canada's commercialization priority, the NRC Technology and Industry Support portfolio (TIS) works closely with the NRC Research and Development portfolio to increase the commercialization of research through: technology licensing; provision of pre-commercialization assistance, mentoring and business intelligence to Canadian firms; access to

vital national and international networks; knowledge dissemination and expertise; and helping companies create new products and/or new technologies. In addition, it collaborates with key partners to develop strategic initiatives to accelerate the successful competitiveness/ commercialization of new technologies. TIS also helps to fuel the growth and innovative capacity of SMEs, and continues to streamline its approach to intellectual property management and the transfer of technology.

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

Program Spotlights - Industrial Research Assistance Program (NRC-IRAP: Grow SMEs through innovation capacity support and expertise)

Description: NRC-IRAP is the agency'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: SMEs engaging in high-risk, technologically sophisticated R&D face increasingly complex challenges. NRC-IRAP will support these technology-based SMEs in growing and becoming more competitive by focusing on: increasing the rate of growth of SMEs; expanding the number of SMEs that successfully commercialize their products, services and processes; assisting with potential international collaborations on technology development projects; and providing international opportunities to clients looking to gain knowledge to advance their R&D projects.

Build on the success of the Competitive Technical Intelligence (CTI) pilot program: NRC-IRAP and NRC-CISTI will continue to develop CTI services in order to provide best-in-class strategic advice to Atlantic cluster participants and optimize NRC investments. For example, NRC-IRAP and NRC-CISTI will be adding a Technical Business Analyst presence in St. John's, NL and are integrating CTI advice into NRC-IRAP's portfolio of services to Atlantic and Nunavut firms. NRC-CISTI and NRC-IRAP are also working together to provide CTI to SMEs in other parts of Canada. NRC-IRAP has developed an in-house capability to capture CTI, and as a next step, will integrate this information into the strategic planning and business strategies of client firms.

2006-2007 Financial Resources

Planned	Total Authorities	Actual
$143.3 million	$172.2 million	$157.6 million

Planned Results (from 2006-2007 RPP):

- To increase the innovation capacity of Canadian SMEs
- To increase the growth of Canadian SMEs

2006-2007 Performance:

Increased capacity of SMEs to undertake highly innovative technology-based R&D projects:

- NRC-IRAP funded the hiring of highly qualified and skilled engineers and scientists as well as internships for university and college graduates (431 through Human Resources and Social

Development Canada's Youth Employment Strategy).

- NRC-IRAP contributed to organizations by providing technical and research assistance to Canadian SMEs (8,432 firms).
- Housed NRC-IRAP staff within universities and research facilities to facilitate linkages (135 Industrial Technology Advisors).
- Contributed funding through IRAP-TPC for pre-commercialization assistance to SMEs ($11.6 million).

Competitive Technical Intelligence (CTI):

- The NRC-IRAP/NRC-CISTI Memorandum of Agreement (MOA) for the provision of basic information services to NRC-IRAP Industrial Technology Advisors (ITAs) across Canada was renewed for 2006-2007 with some slight modifications. Along with the consistent national delivery of basic NRC-CISTI information services, NRC-CISTI and NRC-IRAP have been collaborating at the regional level in the delivery of CTI services in Atlantic/Nunavut, Manitoba and Quebec. This included the launch of a CTI pilot service to a limited number of ITAs in Quebec, the expansion of the CTI services in Atlantic/Nunavut to include Newfoundland and Labrador/Nunavut, and the hiring of a NRC-CISTI Technical Business Analyst (TBA) to work out of the NRC Centre for the Commercialization of Biomedical Technology. Responding to the growing SME demand for competitive technical intelligence, NRC-IRAP and NRC-CISTI escalated this initiative and now coordinates the management of all NRC-CISTI services to NRC-IRAP under one national MOA for years 2007 to 2010.

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

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

Strategy: Contribute to Canada's commercialization priority by strengthening industry ability to generate and apply new ideas and foster commercial applications of S&T

NRC is exploring how to complement and build upon its internationally recognized industrial support and R&D programs to contribute to the overall strengthening of Canada's commercialization efforts – NRC nurtures technology cluster growth across the nation and is doing so with commercialization as a guiding light. In carrying out this strategy, NRC builds on the strengths of both the public and private sectors – nationally, regionally and at the community level. Recognizing that support to technology clusters was a growing part of NRC-IRAP's business, the NRC-IRAP senior management team adopted a strategy in August 2006, which serves as a guide to participation in NRC, as well as other technology clusters in Canada. NRC-IRAP managers will monitor the support provided by the Program over the next several years to determine the most appropriate degree of Program involvement in supporting cluster-associated SMEs versus others.

Strategy: Enhance industry knowledge through development and dissemination of scientific, technical and medical information and intelligence

Program Spotlights - Canada Institute for Scientific and Technical Information (NRC-CISTI): Exploiting information for innovation

Description: The Canada Institute for Scientific and Technical Information (NRC-CISTI) is Canada's national science library, and the largest comprehensive source of scientific, technical and medical (STM) information in North America. Through its publishing arm, NRC Research Press, NRC-CISTI is also Canada's foremost scientific publisher. Responding to demands from clusters and NRC institute commercialization initiatives for intelligence and information services, in 2001 NRC-CISTI leveraged its competencies in global S&T information by establishing an Information Services directorate. Today, NRC Information Centres serve private and public sector researchers associated with NRC institutes and clusters across Canada.

Plans: NRC-CISTI's Strategic Plan 2005-2010 sets out its vision: to be a leader in driving the exploitation of scientific information to create value for Canadians. Its mission is to advance research and innovation through high-value information and publishing services in science, technology and medicine.

NRC-CISTI will create value for Canadians by improving the flow of scientific information in four ways:

- An integrated "infostructure": storage of and access to electronic scientific information, using intelligent search and analysis tools. Partnership will be key to developing this system.
- Scientific publishing infrastructure, using online peer review, editing and publishing tools that will shorten the time between discovery and publication without sacrificing quality.
- Services to support commercialization and SMEs, such as Competitive Technical Intelligence and patent information analysis – "actionable" information.
- Companies in NRC industrial partnership facilities are key clients and will be offered enhanced services to support their research and development activities.

2006-2007 Financial Resources

Planned	Total Authorities	Actual
$47.8 million	$57.4 million	$52.6 million

Planned Results (from 2006-2007 RPP):

- An integrated national information infrastructure to provide seamless, permanent access to scientific, technical and medical information resources, readily accessible to all Canadians.
- Robust, innovative scientific publishing systems to enable researchers and entrepreneurs to advance and exploit knowledge.
- Leadership of scientific, technical and medical (STM) information communities across Canada to become a national force for innovation.
- Information services that contribute to successful commercialization activities across Canada.

2006-2007 Performance:

Finances – In 2006-2007, NRC-CISTI's total income was $21.8 million (a 7.4% decline from last year) and expenditures were $50.5 million, resulting in 43.2% of expenditures being covered by income.

Canada's Collection of STM Information – A world-class resource, NRC-CISTI has a large collection of scientific, technical and medical (STM) information. In 2006-2007 it maintained its print collection at levels similar to those of the previous year with 49,121 scientific journal titles, of which 9,073 were active subscriptions. The collection also includes 757,500 monograph titles and a large collection of technical reports. Conference proceedings are a specialty, with 205,400 titles.

NRC researchers have access to 6,123 licensed electronic journals, a 20% increase from 2005-2006,

and access to 20,335 other web-based resources, a 14% increase. NRC-CISTI's e-repository collection grew to 6.2 million full text STM articles from 3,600 journals. Collection acquisitions and e-licences are responding to emerging NRC needs for multi-disciplinary and sector STM and business information, to align with the priorities outlined in the NRC Strategy launched in 2006-2007. For example, NRC-CISTI successfully negotiated a licence to a valuable e-resource called *Business Insights* that is available to NRC researchers through the NRC Virtual Library.

Document Access and Delivery – Supplying Canadians with the world's STM research publications.
While the bulk of Canadian orders for articles in 2006-2007 were from clients in the academic (37%) and industry (28%) sectors, there was a 27% increase in documents ordered by clients in the Canadian medical sector.

In line with the transition from print to digital content, NRC-CISTI is continuously enhancing its digital infrastructure and document delivery systems. Among other service improvements, in March 2007 NRC-CISTI launched a pay-per-article service which provides immediate on-line access to locally-loaded digital content in NRC-CISTI's e-repository – almost 1 million articles and growing.

NRC-CISTI continues to expand the content access and delivery services it offers Canadians and its international clients though partnerships with leaders in the international information services industry. In August 2006, NRC-CISTI entered into a new alliance with FIZ Autodoc, a German document delivery broker that partners with renowned national and international scientific libraries, aggregators and publishers. This alliance allows NRC-CISTI to improve worldwide access to its collection, and allows FIZ Autodoc to add many new journal titles to its service.

Information on NRC-CISTI's service standards can be found in Table 3-7B. In its June 2006 *Product Satisfaction Scorecard,* Outsell Inc. reported that NRC-CISTI tops the list of five information providers, scoring highest in three of five categories: Overall Satisfaction, Would Recommend, and Fair Pricing.

In 2007, NRC-CISTI launched the NRC Publications Archive (NPArC) pilot project which will allow the NRC to better promote its research activities, measure its performance and make its publications openly accessible to the scientific community.

Building Canada's scientific infostructure (Csi) – Enabling access to digital STM information.
In 2006-2007, NRC-CISTI extended its partnership support activities, expanding its Partnership Development Office to liaise with current and potential partners on initiatives that include the Federal Science eLibrary and the National Network of Libraries for Health. Negotiation for licensing of electronic content is a key component of networked access.

Competitive Technical Intelligence and Information Services – Growing to meet demand.
In 2006-2007 the NRC Information Centre staff in the Atlantic cluster performed searches for and assisted more than 2600 clients, a 16% increase in the number of clients over the previous year.

In response to the emphasis on R&D commercialization support outlined in the new NRC Strategy, in 2006-2007 NRC-CISTI expanded its competitive technical intelligence (CTI) services to researchers, institute business development officers, and NRC senior management, as well as to Canadian small- and medium-sized enterprises (SMEs) through NRC-IRAP. Decision-makers value CTI services that assess the commercial potential of new technologies, validate market demand, identify competitors and potential partners, propose product adjustments and recommend product price. The information gives their organizations a competitive advantage in the international marketplace and supports successful applications for R&D capital investments that will generate substantial economic benefits for Canada.

NRC-CISTI delivered 250 CTI reports to clients in 2006-2007, compared to 75 in 2004-2005.

NRC Research Press – Making Canadian research available to Canadians and around the world. The NRC Research Press publishes half of its 16 scientific journals using a cutting-edge publishing system that puts Research Press at the forefront of current scientific publishing technology, on par with other leaders in the field. The NRC Research Press Books and Monograph Program publishes scientific treatises and conference proceedings.

The NRC Research Press has implemented a new policy on providing free or "open" access to selected articles and journals. All users have free access to selected "newsmaker" articles. As well, the author, funding agency or other sponsor now has the option of paying a fee to cover the costs of peer-review and publication, thus ensuring that access to that particular article in a journal will be free.

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

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

Strategy: Facilitate the integration of intellectual property management strategies in Institute plans

Improve NRC's Intellectual Property Management – NRC's Business Review project, completed in 2006-2007, highlighted the need for integration of best intellectual property (IP) management practices across the organization. To address this challenge, the technology and industry support portfolio (TIS) is piloting a new group, starting May 2007, mandated with providing business support to institutes and programs to enable the best possible decision-making related to IP management. Some of the key areas of initial focus include invention disclosure review whereby institutes receive support from NRC patent agents regarding patentability and marketability assessment for new technologies before deciding to proceed with further investment in protection and/or licensing. TIS is also working with institutes to facilitate the integration of IP management strategies in institute business plans to ensure this important function remains a key part of the institutes contributing towards the NRC Strategy.

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

Performance Indicators (as identified in the 2006-2007 RPP)	• Size of network and degree of interaction among cluster partners • Increase in research collaborations, licensing, joint patent applications, etc. • New firm formation (firms gravitate to the cluster, incubating firms and co-locating firms, etc.) • Investment attracted to the cluster

The performance indicators that do not change year-over-year are not reported on annually.

NRC is committed to fostering the growth of community-based technology clusters across Canada. NRC's technology cluster strategy builds on existing local strengths by: implementing R&D programs that support local industry needs; providing state-of-the-art facilities, trained personnel, business incubation opportunities and other specialized services (NRC-IRAP, NRC-CISTI); and

supporting the alignment of key stakeholders around community strengths. NRC received new funding ($110 million over the next five years) to further implement its national Technology Cluster Strategy in Atlantic Canada and has begun the process for renewing the funding for its Round II Clusters in Eastern, Central and Western Canada. The ultimate benefit for Canadians will be the emergence of globally competitive technology clusters leading to higher productivity, new jobs and expanded trade.

Strategy: Focus on cluster growth through targeted R&D programs and partnerships with other S&T organizations

Build on successes from NRC's Atlantic Initiatives, Phase I – NRC continued to nurture the growth of its Atlantic cluster initiatives by maintaining leading-edge research capabilities (infrastructure and human capital), developing research collaborations with cluster firms, fostering increased networking and knowledge-sharing and supporting the involvement of firms and other partners in the cluster.

- Information Technology (New Brunswick) – NRC-IIT has been working closely with the Atlantic Canada Opportunities Agency (ACOA) to identify R&D opportunities where resources can be aligned to support the most innovative SMEs with high IP commercialization potential. In the recent round of Atlantic Innovation Fund disbursements, one project supported by ACOA and NRC-IIT was selected: Genomically Guided Biomarker Discovery for Cancer. The Atlantic Cancer Research Institute (ACRI) is receiving $2.9 million over three years from the Fund for this collaborative project with NRC-IIT. NRC-IIT's role is to further validate its prostate cancer biomarker with the intent of securing a partner for commercialization. NRC-IIT will use a similar algorithm to identify and validate biomarker panels for breast, ovarian, lymphoma and lung cancers. The ultimate goal is to provide a multiple-cancer diagnostic panel.

  The University of Moncton teamed up with NRC-IIT and a leading e-learning software company, Desire2Learn, to launch a research initiative to develop a software suite that will significantly decrease production times and costs in the development of electronic content in e-learning. The total estimated project cost is $5.5 million.

- Ocean Technologies (Newfoundland and Labrador) – The Newfoundland and Labrador cluster is healthy and vibrant, as indicated in a recent independent study conducted for Industry Canada and OceansAdvance.

  NRC-IOT's world-class facilities, as well as high-quality research and performance evaluation expertise, attract research projects and business opportunities to the cluster. NRC-IOT's Ocean Technology Enterprise center continues to host companies developing commercial products in ocean technologies. Private cluster companies, using NRC-IOT facilities, bring more than $6M annually to the cluster. This has helped to establish St. John's and NRC-IOT as world leaders in the field of marine performance evaluation. NRC-IOT stimulates research and technology development activity in the cluster by fostering research collaborations engaging local companies, thus helping build their expertise in technology capacity.

OceansAdvance was launched through a partnership between NRC-IOT, NRC-IRAP and the Province of Newfoundland and Labrador (NL). The corporation was started in the belief that more proactively promoting the "Cluster" concept in ocean technology - a technical/industrial specialty that Newfoundland and Labrador was already pursuing - would strengthen the economic performance of the region. NRC-IOT continues to host and provide infrastructure support to their considerable cluster development activities. OceansAdvance has an active private sector board of directors and is horizontally funded by NRC-IRAP, ACOA, the Province of NL and Industry Canada.

- Life Sciences (Nova Scotia) – Local industry and community leaders are taking ownership of a road-mapping process for the cluster with which the NRC Institute for Marine Biosciences (NRC-IMB) is involved. The roadmapping exercise is being conducted to ensure alignment of resources to the cluster's vision and objectives. An Atlantic Commercialization Centre was established at the NRC-IMB Industry Partnership Facility in 2006-2007 with a dedicated team led by a Senior Life Sciences Development Officer. The Centre will provide commercialization services to the entire life sciences community, including private industry and promising ventures flowing out of research activity in the region.

  The NRC Institute for Biodiagnostics in the Atlantic (NRC-IBD Atlantic), a satellite of NRC-IBD headquartered in Winnipeg, continued to conduct world-class collaborative research that will lead to advances in the evaluation, diagnosis and treatment of brain diseases and disorders. It also continued to transfer medical technology innovations that will benefit Atlantic Canada's economic sectors. In conjunction with the NRC-Institute for Marine Biosciences, the Izaak Walton Killam Hospital and Dalhousie University, NRC-IBD further expanded the life sciences infrastructure in Halifax with the creation of a Biomedical Magnetic Resonance Imaging Lab. This laboratory, which will be operational in 2007-2008, will allow researchers to link pre-clinical models to patient-centred diagnosis and treatment for a broad range of diseases. Research will focus on Magnetic Resonance Imaging studies including drug development and delivery and cellular/molecular imaging.

Encourage more involvement / commitment of cluster partners – In 2006-2007, NRC followed up on lessons learned from the evaluation of its Atlantic Canada cluster initiatives and built upon existing successes, such as:

- Medical Devices Technologies (Manitoba) – The NRC Centre for the Commercialization of Biomedical Technology (NRC-CCBT) is catalyzing cluster development in Winnipeg. The NRC-IBD spin-off company, Biomedical Commercialization Canada, offers a wide array of services to support commercialization of start-up companies; four new companies in varying stages of mentorship entered into the commercialization mentoring program in 2006-2007, while four more companies are expected to join the program in the near future. An additional fifteen organizations are co-locating tenants. In addition to small science-based businesses, these tenants include trade organizations, such as the Health Care Products of Manitoba and other science-based organizations, such as the International Centre for Infectious Diseases, NRC-IRAP and NSERC. Other co-locating tenants, such as a business law firm and a management consulting firm, are situated in NRC-CCBT to provide services to the incubating companies.

- Canadian Photonics Fabrication Centre (Ontario) – The Canadian Photonics Fabrication Centre (NRC-CPFC) continued to be a key pillar supporting Canada's position in the international photonics landscape in 2006-2007. In providing a world-class industrial grade fabrication facility, NRC-CPFC provides services both regionally and nationally, bridging the gap between leading edge photonics research and commercialization. Canada's largest photonics cluster is Ottawa, with close to 85 companies, universities and federal laboratories delivering photonics solutions, and a further 1800 high-tech firms employing 76,000 people engaged in information technology, communications, life sciences and security. As a result of downsizing of JDS Uniphase and Nortel laboratories in Ottawa, many small high tech firms were created by entrepreneurial employees who look to NRC-CPFC for fabrication capabilities that would be impossible for them to develop in-house. In addition, NRC-CPFC has become a training ground for the next generation workforce required to keep Canada at the leading edge in photonics R&D. Through an agreement with Carleton University, 30 students had access to the NRC-CPFC facility in 2006-2007; additional highly qualified personnel (HQP) accessed the facility through the auspices of CMC Microsystems. A two-day course for college students was attended by 24 participants from Algonquin College. In 2006-2007, NRC-CPFC signed contracts worth over $1 million with industrial clients.

From emerging to developing – Moving cluster initiatives forward – The majority of NRC's recently-launched cluster activities are still in the very early stages of development, focused on establishing facilities, attracting skilled human resources, and developing networks of public and private sector partners and R&D support. In 2006-2007, NRC continued to foster their growth 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 the plant biotechnology (Saskatoon) and biopharmaceuticals (Montreal) clusters. The following are examples of early-stage cluster initiatives that NRC continued to move forward in 2006-2007:

- Nanotechnology (Alberta) – In June 2006, NINT celebrated the opening of one of the world's most technologically advanced research facilities. NINT is constructed as a partnership among NRC, the Government of Alberta and the University of Alberta to establish a unique research and development environment that combines the creative and competitive research culture of the university sector with the strategic and outcome-focused culture of a federal laboratory. This unique partnership interacts with the private sector in novel ways, leading to research collaborations with industrial partners. To date, collaborative arrangements have been signed with a number of companies such as Xerox, HP and several firms in the region, valued at well over $4 million including provincial investments.

  A cluster has begun to take shape through nanoMEMS Edmonton, a community-based development organization bringing together NRC, the City of Edmonton, the University of Alberta, Western Economic Development, Micralyne Inc, Bigbandwidth and other local industrial proponents to accelerate the growth of nanotechnology in the region. NINT is central to the Alberta Nanotechnology Strategy, announced in May 2007. The strategy allocates $130 million in funding over five years for R&D leading to economic benefits in sustainable energy; medical and health technologies; and agriculture, food and forestry.

- Nutraceutical and Functional Food (Saskatchewan) – In the Saskatoon area, there are approximately 30 "nutraceutical" and "functional food" companies jostling for market share, generating annual revenues of nearly $60 million – the number of firms throughout western Canada is constantly increasing. NRC identified key issues faced by this sector including lack of access to business/marketing intelligence, management training, expertise in technology management, knowledge of regulatory issues and early stage capital. In response to these gaps, it officially launched the BioAccess Commercialization Centre in November 2006 to help support western Canada SMEs in the healthy foods and natural health products industries survive the critical startup phase. Located at the NRC Plant Biotechnology Institute (NRC-PBI) in Saskatoon, the new Centre represents a single point of contact for Western Canadian healthy foods and natural health products firms seeking research assistance, business expertise, or competitive technical intelligence.

- Aluminium Technology (Quebec) – The NRC Aluminium Technology Centre (NRC-ATC) provides Canadian industry with the expertise and technical support needed to develop high valued-added aluminium products and services. The goal of the NRC-ATC is to develop, in concert with its partners, leading-edge technologies attractive to the aluminium parts manufacturing industry. In 2006-2007, NRC-ATC started working with auto parts manufacturers and a major automobile manufacturer to assess the performance of formed aluminium automobile parts and structures. The ability of structures to absorb energy in catastrophic collisions is essential to provide security to the occupants of the vehicle. By increasing the amount of aluminium in automobiles their weight can be reduced which in turn reduces the amount of power needed, leading to a reduction in energy consumption and emissions of greenhouse gases.

- Urban Infrastructure (Saskatchewan) – The initial focus of the NRC Centre for Sustainable Infrastructure Research (NRC-CSIR) is on the development and management of sustainable water and wastewater infrastructure. In 2006-2007, work continued on understanding the developing soil-pipe interaction modelling for simulating pipe behaviour under typical environmental scenarios; developing a hardware and software prototype for permanent flow monitoring in sanitary/storm sewer networks; developing an innovative algorithm for renewal planning of water, sewer and road networks; and providing in-kind-support to the City of Regina to assess the contribution of weeping-tile water to wet-weather flows in the city's domestic sewers. These projects include in-kind support from and close collaboration with the City of Regina as a partner and "living laboratory".

- Biosciences (Prince Edward Island) – The NRC Institute for Nutrisciences and Health (based in Charlottetown) and partners from the Atlantic Canada Opportunities Agency, the Province of Prince Edward Island (PEI) and the University of PEI, are helping that community extend and develop existing expertise and capacity in the area of bioresources.

  The NRC Institute for Nutrisciences and Health (NRC-INH) brings to the cluster its expertise in identifying how bioactive compounds found in nature can be used to improve human and animal health, particularly in three key areas: neurological disorders (such as Alzheimer's disease); obesity-related disorders (such as diabetes); and infection and immunity (such as viral infections). In addition to bringing world-class scientists, equipment and infrastructure to the table, the Institute presents a bold new model in research partnerships which enables

university, government and private sector scientists to work side by side towards a common theme of discovery, innovation and commercialization. They collaborate with colleagues in the region and around the globe, ensuring that the latest technologies and methodologies are used to address critical health issues affecting Canadians and the population worldwide.

The PEI cluster can already boast some impressive job and revenue figures. In 2006-2007, 650 people were employed in the sector – 400 with 20 private sector companies, and 250 with 10 public sector organizations. In 2005, the PEI bioresources cluster generated $61 million in private sector revenues. The PEI BioAlliance has set targets for 2010: 1,000 private sector employees, $200 million in private sector revenues, and an R&D expenditure increase from $40 to $60 million. NRC will play a key role in helping this new industry reach these targets.

Expand network of Industrial Partnership Facilities (IPFs) – In support of its cluster development activities, NRC continued to develop, build and operate Industry Partnership Facilities across Canada. These unique facilities are workplaces for collaborative research and the incubation of new firms and NRC new ventures. They also serve as community resources for access to mentoring, innovation financing and competitive technical intelligence for new enterprises. In 2006-2007, NRC had 15 IPF locations across the country with a complement of 122 incubating firms and 9 graduated tenants over the year. In 2006-2007, two new facilities opened, bringing the total space available to industry in IPFs to just under 30,000 square metres. 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
1	Institute for Ocean Technology (St John's, Newfoundland)	441[1]	in operation	2003-2004	88%
2	Institute for Marine Biosciences (Halifax, Nova Scotia)	1,036[2]	in operation	2004-2005	22%
3	Institute for Information Technology (Fredericton, New Brunswick)	627[3]	in operation	2002-2003	87.5%
4	Biotechnology Research Institute (Montreal, Quebec)	9,800	in operation	1997-1998	95%
5	Industrial Materials Institute (Boucherville, Quebec)	2,180	in operation	2003-2004	52%
6	NRC Industry Partnership Facility, M-50 (Ottawa, Ontario), (shared facility with several Institutes)	1,604	in operation	1998-1999	82%
7	NRC Industry Partnership Facility, M-23A (Ottawa, Ontario), (shared facility with several Institutes)	297	in operation	2004-2005	14%
8	100 Sussex Industry Partnership Facility (Ottawa, Ontario), (shared facility with several Institutes)	509	in operation	2003-2004	90%
9	Institute for Biodiagnostics (Winnipeg, Manitoba)	1,194	in operation	2005-2006[4]	59%
10	Plant Biotechnology Institute (Saskatoon, Saskatchewan)	7,314	in operation	2002-2003	99%
11	Institute for Fuel Cell Innovation (Vancouver, British Columbia)	1,209	in operation	1999-2000	85%

12	Herzberg Institute of Astrophysics (Penticton, British Columbia)[5]	141[6]	in operation	2001-2002	73%
13	Institute for Nutrisciences and Health (Charlottetown, Prince Edward Island)	477	in operation	2006-2007	54%
14	Institute for Aerospace Research (Montreal, Quebec)	929	in operation	2006-2007	0%[7]
15	NINT Innovation Centre (Edmonton, Alberta)	2,700	construction	2007-2008	-
	Total	30,448			

[1] total area reduced by 60 m^2 when temporary offices were removed (NRC-IOT).
[2] number was incorrectly reported as 691 m^2 in 2005-2006 (NRC-IMB).
[3] area incorrectly reported in 2005-2006 as 1000 m^2 (NRC-IIT).
[4] 477 m^2 of this space has been operational since 1995-1996 (NRC-IBD).
[5] space previously designated as IPF space in Victoria has been allocated to LRP work (NRC-HIA).
[6] additional space allocated to the Okanagan Research and Innovation Centre (ORIC) (NRC-HIA).
[7] no occupancy is due to facility opening in February 2007.

Engage and link community groups through horizontal support (NRC-IRAP and NRC-CISTI) – A priority for NRC-IRAP over the past several years has been to engage and link regional groups as part of developing the technical, financial and business networks vital to cluster development. In 2006-2007, NRC-IRAP continued its leadership role in collaborating and developing partnerships between regional players in order to strengthen the regional innovation infrastructure required to foster cluster development. In various clusters, NRC-CISTI has established NRC Information Centres (NIC), co-located at NRC institutes. NICs offer scientific, technical, medical and business-related information and analysis services to NRC researchers, companies located onsite and external clients in the region. In 2006-2007, NRC-CISTI partnered with institute outreach activities to promote and deliver an integrated package of services to regional clientele.

Strategy: Pursue long-term investment and management strategy centered on sustained effort and patient investment

Enhance collaborative partnerships – The full development of NRC cluster initiatives is expected to be a long-term commitment, with a cluster taking at least 15 to 20 years to reach full maturation. NRC increased its efforts to develop collaborations and partnerships with industry and engage stakeholders to contribute to the development of clusters across Canada. Table 2-3 provides a list of the cluster initiatives and financial resources involved.

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

Location	Focus	Resources
2005-2006 to 2009-2010		
Halifax, NS	Life sciences (NRC-IMB and NRC-IBD)	$19.5 million
Fredericton, Moncton and Saint-John, NB	Information technology	$48.0 million
St. John's, NL	Ocean technology	$16.0 million
Atlantic Canada	Coordination, administration, special studies, innovation assistance, S&T knowledge,/ information dissemination	$26.5 million

2002-2003 to 2006-2007		
Saguenay-Lac-Saint-Jean, QC	Aluminium technologies	$27.0 million[1,2]
Ottawa, ON	Photonics	$30.0 million
Winnipeg, MB	Medical device technologies	$10.0 million
Saskatoon, SK	Plant nutraceuticals	$10.0 million
Edmonton, AB	Nanotechnology	$60.0 million[3]
Vancouver, BC	Fuel cells	$20.0 million
2003-2004 to 2007-2008		
Charlottetown, PE	Nutrisciences and health	$ 20.0 million
Regina, SK	Sustainable urban infrastructure	$ 10.0 million

[1] An additional $5.0 million was received in 2001-2002.

[2] CED contributed an equal amount.

[3] The Province of Alberta also contributed $60.0 million.

Strategy: Sustain continuous improvement through unique and innovative performance measurement strategies

NRC has developed a cluster measurement approach that builds on the research of Innovation Systems Research Network (ISRN). Tailored to NRC, this approach incorporates a model of cluster development that reflects NRC's role and contribution as well as those of other key stakeholders (firms, governments, customers and competitors). Key components include a framework that lays out an overarching set of indicators of cluster development, and a series of tools to determine where each cluster is situated in terms of development. These include a comprehensive survey of cluster firms, interviews with firms and key stakeholders and social network analysis. In 2006-2007, NRC completed key projects to develop baseline measures that track the progress of cluster development in Winnipeg, Saskatoon, Edmonton, Vancouver, the Saguenay and Ottawa. These activities provided information to support efforts to renew cluster initiatives funding.

NRC is continuing its commitment to assess the progress of its cluster initiatives to ensure they are on track to meet objectives. During 2006-2007, NRC evaluated the cluster initiatives that received funding for the period between 2002-2003 and 2006-2007 (Round II Clusters). NRC gathered data from multiple lines of evidence, including reviews of performance data, documentation and literature, interviews with stakeholders and NRC representatives and situation analysis drawn from the baselines. The evaluations examine the relevance of the initiatives, their success to date, their effectiveness and opportunities for improvement. Reports can be found at: http://www.nrc-cnrc.gc.ca/aboutUs/audit_e.html.

Priority 4: Program Management for a Sustainable Organization

Performance Indicators (as identified in the 2006-2007 RPP)

- 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 Governing Council fulfills its mandated role
- Survey with key stakeholders on perception of NRC

The performance indicators that do not change year-over-year are not reported on annually.

In 2006-2007, NRC identified the broad program areas in which it will focus its resources:

- Nine key industry sectors
- Regional / community innovation, primarily revolving around NRC's technology cluster initiatives
- National priorities in health & wellness, sustainable energy and the environment
- National science & innovation initiatives, including programs where NRC has a national mandate and programs involving major S&T infrastructure

Based on consultation with stakeholders, NRC believes that concentrating its efforts and resources in these areas will yield maximum impact and value for Canada.

Also in 2006-2007, NRC's Senior Executive Committee gave approval for a corporate-wide project (scheduled to start in 2007-2008) to assess the level of reinvestment that is required to sustain the organization's major capital and physical infrastructure. This includes facilities, equipment and information technology (hardware and software). The project teams will report to SEC on recommended investment priorities and the total amount of funding required over the next three-to-five years.

Strategy: NRC Renewal - Reposition for the Future and Address Management Accountability Framework Commitments

Key projects supporting the NRC Renewal Initiative include:

New corporate strategic direction – As discussed in Section I – Agency Overview, four strategy implementation projects were initiated in 2006-2007 to help deliver on the strategy: Research Programs; Business Review; Planning, Performance & Resource Management (PPRM); and Sustainable Organization. Key recommendations from these projects were summarized in a draft version of the NRC Business Plan: 2007-2008-2009-2010. The business plan is expected to be finalized early in 2007-2008 and will serve as a guiding document for all institutes/branches/programs in the implementation of NRC's strategy.

Strategies for sustainable resources – Faced with ongoing resource pressures, NRC will need to make more strategic choices regarding the use of future resources. This will involve:

- Addressing funding issues – In 2006-2007, NRC Senior Executive Committee (SEC) agreed to the following approach for addressing NRC's long-term financial sustainability:

  1. Focus the organization's resources on R&D priorities as outlined above.

  2. Identify internal operational efficiencies
  The VP Corporate Services is leading an effort to increase efficiencies in administration services.

  3. Work increasingly with collaborators
  NRC can maximize its impact for Canada by working with others (other government departments, universities, private industry) to help solve complex S&T-based social and

economic problems. Collaborations allow NRC to leverage the resources required to undertake research and development.

4. Identify and target future investment requirements
In support of its strategy, NRC will identify target areas that may require new or enhanced levels of investment. NRC will develop a business case outlining areas requiring new investment, the rationale for investing in these areas and the expected benefits for Canada.

These sustainability measures are expected to be implemented starting in 2007-2008. Most of these measures are expected to be ongoing efforts that will form part of NRC's annual planning and priority setting process for resource allocation.

- Recruiting, retaining and training S&T people – The NRC Human Resources Management (HRM) Strategy is currently being revisited in light of NRC's new strategic and business plans. As a part of this process the five pillars of the HRM Strategy are being revised to ensure they are aligned with the NRC Strategy to 2011. Following are some highlights of progress that took place in 2006-2007 in achieving goals established in the previous HR plan:

  - In 2006-2007 the NRC learning agenda was advanced considerably. Orientation sessions for new employees via webcast were launched across NRC. In an effort to advance the leadership skills of the Group Leader cadre, "Leading Scientific Teams" workshops were attended by NRC's Group Leaders and Directors. The NRC-HRB Learning Centre resources were re-launched under the NRC-CISTI catalogue, promoting wider access to resources for personal and professional development. A successful Administrative Support (AD) conference, the third of its kind dedicated to AD career development, was held during the year. Finally, a planning session was held with cross-representation from NRC employees and from external federal S&T Community partners to identify challenges and opportunities to be addressed in the development of a Learning Plan for NRC.

  - 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 process, 17 candidates were selected from more than 70 applicants for LEAD. The participants come from NRC institutes across Canada and brought diverse expertise in research, business development, management and community partnership. Beginning in April 2006, for 18 months, these participants worked on real-time NRC issues and participated in workshops to enhance their leadership skills. This first set of participants will officially graduate in fall 2007 and a new call for LEAD 2 participants will be announced.

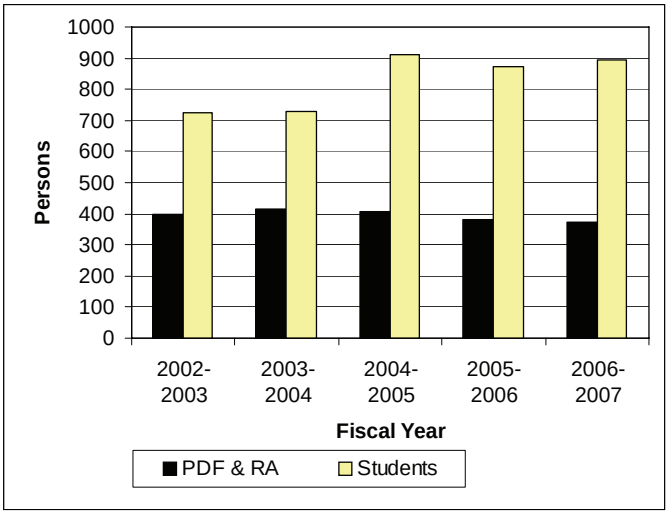
  - In 2006-2007 significant steps were taken to combine the Management level (MG) Merit Review Process with the MG Performance Planning and Review Process. The resulting process is more closely aligned with the Treasury Board Secretariat Management Accountability Framework and the proposed NRC Integrated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

drafting of new Management Accountability Agreements (MAA) for each member of the MG category which were implemented in 2006-2007.

- Several initiatives were developed and/or launched in 2006-2007 with respect to diversity at NRC. Sessions aimed to promote a respectful workplace, communication and conflict resolution, promotion of religious diversity, gender diversity and mental health in the workplace were delivered during the year to a variety of audiences. NRC's Directors General worked toward the achievement of diversity goals as established through their individual Diversity Management Accountability Accords, a process which was initiated several years ago, and was strengthened in 2006-2007 by the addition of performance measures. Finally, a Diversity Risk Assessment was conducted and as a result several initiatives to minimize diversity-related risk were identified and incorporated into NRC's Diversity Plan for 2005-2008.

- HR planning to support the NRC business plan was enhanced, including the piloting of the integration of HR plans with institute/program/branch business plans, the initiation of an HR business plan supported by an HR environmental scan and enhanced HR reporting.

Figure 2-5: NRC Training Programs (2002-2007)



Source: NRC Performance Information Database, 2006

NRC recruited 506 employees bringing the total number of NRC staff to 4,257[10]. Over 1,273 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 2006-2007, 493 graduate students, 401 summer and co-op students, 263 Natural Sciences and Engineering Research Council Visiting PDFs and 111 RAs worked at NRC (see Figure 2-5).

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.

	2006-2007	2005-2006	2004-2005
	(percentage)		
Total Turnover	11.39	10.75	11.08
Total Continuing Turnover	3.36	3.16	3.2

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

[10] Salaried employees, as of 31 March 2007.

Employment Equity - At the corporate level, the representation of visible minorities surpassed availability, whereas the representation of women, Aboriginal peoples and persons with disabilities was somewhat lower than anticipated. Based on these findings NRC has adjusted its corporate and Institute/Program/Branch level employment equity goals to address all remaining areas of under-representation and will adjust its supportive measures where required to attain these goals.

Designated Group	Representation		Availability*		Difference
	number	percentage	number	percentage	number
Women	1,531	35.3	1,567	36.2	-36
Aboriginal peoples	41	0.9	57	1.3	-16
Persons with disabilities	171	3.9	175	4.0	-4
Visible minorities	676	15.6	625	14.4	+51
Total workforce	4,334				

*Source: 2001 Census and 2001 Participation and Activity Limitation Survey (PALS)

Learning - Through internal and external training, conferences and learning opportunities, NRC invests in the development of its workforce. In 2006-2007, $5.1 million was invested in learning, representing 1.7% of salary expenditures (consistent with the investment for 2004-2005 and 2005-2006).

Collective Agreements – NRC's Labour Relations (LR) Group is mandated to negotiate and administer collective agreements on behalf of NRC and to foster the development and maintenance of effective and productive consultations with both Bargaining Agents representing the majority of NRC employees: the Professional Institute of the Public Service of Canada (PIPSC) and the Research Council Employees' Association (RCEA). Ten collective agreements are administered by the LR group, seven of which were negotiated during the 2006-2007 period with three having gone before Arbitration Boards for eventual final determination in April of 2007.

Official Languages (OL) – NRC continues to be committed to its Official Languages Program objectives. There was a slight decrease in the number of NRC executives who meet the linguistic requirements of their positions (from 84% in 2006 to 77% in 2007). This decrease is due to a marked increase in the number of executives hired into bilingual non-imperative positions. All new hires meet with the OL Advisor to establish a language training plan and to secure their commitment to meet OL Program goals. Eighty-nine percent of employees meet the linguistic requirements of their positions (of the 11% that do not meet, virtually all are currently in a language training program or have established a training plan). NRC's Maintenance of Second Language Skills Campaign continues to generate a great deal of interest from members of other federal organizations. For example, in 2006-2007, NRC received unsolicited requests to present its best practices to, amongst others: Heritage Canada, the Office of the Assistant Deputy Minister Library and Archives, the Office of the Superintendent of Financial Institutions and Citizenship and Immigration Canada.

- Maintaining and upgrading NRC S&T infrastructure – The NRC Long Term Capital Plan (LTCP) 2006-2010 will be updated to reflect decisions resulting from NRC's new strategy and

submitted to TBS in the fall 2007. The LTCP provides a comprehensive list of capital assets requirements over the next five years both in new facilities and research equipment. It is anticipated that the LTCP will be restated following the analysis of new NRC Integrated Business Planning Process and data gathered through the completion of building/site assessment studies to be completed over the summer and fall 2007.

NRC continues to recapitalize its assets through the appropriation of $2.5 million used to address the most pressing needs of the infrastructure with a focus being applied to health and safety and life cycle management. Some recapitalization projects completed in 2006-2007 are as follows:

- Replace underground storage tank (M54, Ottawa)
- Remove underground storage tank (U62, Ottawa)
- Replace air compressor (M06,Ottawa)
- Infrastructure improvements (M17, Ottawa)
- New chiller (M23, Ottawa)
- Switchgear upgrade (M50, Ottawa)
- Chilled water piping (M50, Ottawa)
- New chiller and MCC replacement (M55, Ottawa)
- Exterior wall repair and HVAC upgrade (U66, Ottawa)
- Switch gear upgrade (U70, Ottawa)
- Boiler replacement (NRC-IBD, Winnipeg)
- Emergency generator replacement (NRC-IOT, St. John's)
- Steam generator and Capacitor bank replacements (NRC-BRI, Montreal)
- Skylight Replacement (NRC-IMI, Boucherville)
- Exterior wall repairs (NRC-IMB, Halifax)

In addition, throughout the year NRC participated on both the Treasury Board Secretariat-led Capital Asset Review and Barriers to Science and Technology integration exercises.

- Developing three-year NRC Communications Outlook/Strategy – NRC developed and implemented a short-term, one-year internal and external communications strategy in place of a three-year communications outlook. This strategy was designed to support the initial launch and first-stage implementation of NRC's new Strategy – "*Science At Work for Canada: A Strategy for the National Research Council 2006-2011*". In addition to NRC business needs and initiatives, the strategy took into account Government of Canada business and related government S&T priorities, as well as the results of NRC Renewal and business process studies. Development of the full three-year communications outlook – to be launched in 2007-2008 – was also initiated, based on public opinion research about NRC, its services and its service delivery practices. This outlook will support the full implementation of the NRC business plan and its key commitments in R&D, industry support, community economic growth and its focus on critical issues in health, environment and energy.

  In 2006-2007, NRC also continued its involvement in interdepartmental and government-wide communications efforts related to S&T and innovation initiatives, including: the S&T Integration Board; new Science Outreach programming and initiatives such as the Great Canadian Science Adventure and NRC's leadership of the Canadian National Marsville Competition; the Canada-U.S. Enhanced Representation Initiative; and the Government of Canada S&T web Portal. Further, NRC partnered with a number of other government departments in developing

the *Services for Business* ad campaign to support efforts to awareness of the spectrum of services available to businesses from across the entire Industry Portfolio.

- Internal Audit – In direct response to the new TBS Policy on Internal Audit that came into effect 1 April 2006, the Internal Audit function at NRC underwent considerable reorganization and increased funding. In addition to staffing the newly created position of Director, Internal Audit who serves as the Council's Chief Audit Executive; two Audit Manager positions were also staffed with experienced and professionally accredited auditors. Both a revised Internal Audit Charter and a multi-year risk-based audit plan were approved by the NRC Audit, Evaluation and Risk Management Committee. Some delays were experienced in fully implementing the audit plan due to ensuring appropriate recruitment of staff. However, it is expected that audit work undertaken in 2006-2007 pertaining to the Management of Information Technology Security, the Industrial Research Assistance Program and compliance audits with respect to travel, hospitality, contracts and acquisition cards will be finalized in 2007-2008.

Strategy: Continue to address recommendations of Auditor General of Canada

Implement Action Plan on recommendations of the Auditor General of Canada – The Office of the Auditor General of Canada (OAG) conducted an audit of NRC in 2003-2004 to assess NRC's systems and practices for setting strategic directions for its research activities, to determine whether NRC managed activities to maximize results, and to assess whether NRC measured and appropriately reported the results and impacts of its efforts. In 2006-2007, the OAG examined progress made by NRC in addressing recommendations from the OAG's 2004 audit of NRC Management of Leading-Edge Research. The OAG noted that NRC has made satisfactory progress overall since 2004 in responding to the previous OAG recommendations. More details can be found in Table 3-11.

Section III – Supplementary Information

Organizational Information

NRC Mandate

Under the National Research Council Act, NRC is responsible for:

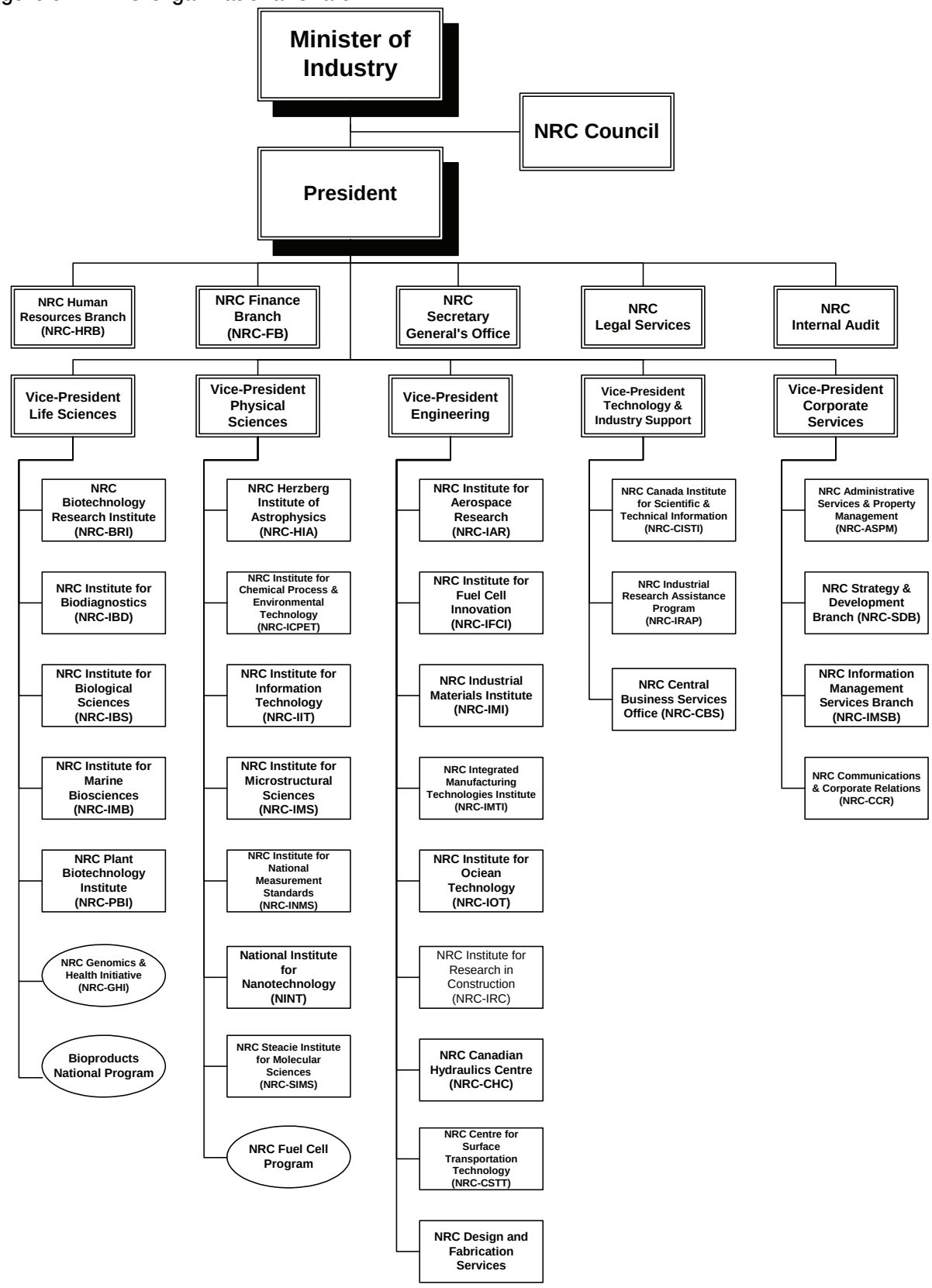
- Undertaking, assisting or promoting scientific and industrial research in different fields of importance to Canada.
- Establishing, operating and maintaining a national science library.
- Publishing and selling or otherwise distributing such scientific and technical information as the Council deems 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.
- Providing vital scientific and technological services to the research and industrial communities.

Consult http://laws.justice.gc.ca/en/n-15/87335.html for more details about NRC's legislative framework.

NRC Accountability Framework

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 innovation of firms through S&T, growth of small- and medium-sized firms (SMEs) and economic growth of Canadian communities. The NRC Governing 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, and centres. Figure 3-1 provides an overview of NRC's organization.

Figure 3-1: NRC Organizational Chart



NRC Resources

Table 3-1: Comparison of Planned to Actual Spending, incl. FTE (millions of dollars)						
			2006-2007			
Program Activity	2004-05 Actual	2005-06 Actual	**Main[1] Estimates**	**Planned Spending**	**Total Authorities**	**Actual**
Research and Development	498.4	519.1	498.0	508.9	613.0	**530.0**
Technology and Industry Support	214.0	215.8	194.4	205.2	231.7	**212.0**
Total	**712.4**	**734.9**	**692.4**	**714.1**	**844.7**	**742.0**

Total	**712.4**	**734.9**	**692.4**	**714.1**	**844.7**	**742.0**
Less: Spending of Revenues Pursuant to section 5(1)(e) of the NRC Act	(59.4)	(85.2)	N/A	(73.5)	N/A	(55.6)
Plus: Cost of Services received without charge[2]	21.1	25.0	N/A	25.9	N/A	27.6
Net cost of Department	**674.1**	**674.7**	**N/A**	**666.5**	**N/A**	**714.0**

Full Time Equivalents (FTE)	**4,178**	**4,155**	**N/A**	**4,033**	**N/A**	**4,191**

Notes

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

(2) 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 Human Resources and 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)						
	2006-2007 Budgetary					
Program Activity	**Operating[1]**	**Capital**	**Grants and Contributions**	**Total: Gross Budgetary Expenditures**	**Statutory Items[2]**	**Total**
Research and Development						
Main Estimates	347.8	45.6	58.9	452.3	45.7	498.0
Planned Spending	*358.0*	*46.3*	*58.9*	*463.2*	*45.7*	*508.9*
Total Authorities	403.1	48.6	65.4	517.1	95.9	613.0
Actual Spending	**346.2**	**48.0**	**59.1**	**453.3**	**76.8**	**530.0**
Technology and Industry Support						
Main Estimates	93.8	1.4	71.4	166.6	27.8	194.4
Planned Spending	*104.4*	*1.6*	*71.4*	*177.4*	*27.8*	*205.2*
Total Authorities[3]	111.7	1.3	80.5	193.5	38.2	231.7
Actual Spending	**99.2**	**2.0**	**77.0**	**178.2**	**33.7**	**212.0**
Total						
Main Estimates	441.6	47.0	130.3	618.9	73.5	692.4
Planned Spending	*462.4*	*47.9*	*130.3*	*640.6*	*73.5*	*714.1*
Total Authorities	514.8	49.9	145.9	710.6	134.1	844.7
Actual Spending	**445.4**	**50.0**	**136.1**	**631.5**	**110.5**	**742.0**

Notes

(1) Operating includes contributions to employee benefit plans.

(2) Spending of revenues pursuant to the NRC Act.

Table 3-3: Voted and Statutory Items (millions of dollars)					
		2006-2007			
Vote or Statutory Item	Truncated Vote or Statutory Wording	Main Estimates	Planned Spending	Total Authorities[1]	Total Actuals
	National Research Council Program				
55	Operating expenditures	393.5	414.3	460.2	**445.6**
60	Capital expenditures	47.0	47.9	49.9	**49.9**
65	Grants and contributions	130.3	130.3	145.9	**136.0**
(S)	Spending of revenues pursuant to the National Research Council Act	73.5	73.5	133.7	**55.6**
(S)	Contributions to employee benefit plans	48.1	48.1	54.6	**54.6**
(S)	Spending of proceeds from Disposal of Crown Assets	-	-	0.3	**0.3**
(S)	Collection Agency Fees	-	-	0.1	**0.1**
	Total	**692.4**	**714.1**	**844.7**	**742.1**

Table 3-4: Services Received Without Charge (millions of dollars)	
	2006-2007
Contributions covering employers' share of employees' insurance premiums and expenditures paid by TBS (excluding revolving funds)	25.8
Salary and associated expenditures of legal services provided by Justice Canada	0.6
Worker's compensation coverage provided by Human Resources and Social Development Canada	0.4
Accommodation provided by Public Works and Government Services Canada	0.2
Payroll Services provided by Public Works and Government Services Canada	0.2
Audit Services provided by the Office of the Auditor General	0.5
Total 2006-2007 Services received without charge	**27.6**

Table 3-5: Sources of Respendable Revenue (millions of dollars)						
			2006-2007			
Program Activity	**Actual 2004-05**	**Actual 2005-06**	**Main Estimates**	**Planned Revenue**	**Total Authorities**	**Actual**
Research and Development						
Fee for Service	29.6	38.7	31.4	31.4	54.0	**54.0**
Rentals	2.8	3.1	3.1	3.1	3.0	**3.0**
Royalties	4.9	6.3	5.5	5.5	5.5	**5.5**
Publications	1.8	3.0	7.3	7.3	4.6	**4.6**
Other	5.2	3.1	2.7	2.7		**-**
Revenues Available for Use from Prior Years	-	-	-	-	38.4	**-**
Technology and Industry Support						
Fee for Service	6.7	6.1	1.1	1.1	7.8	**7.8**
Rentals	0.2	0.1	0.2	0.2	-	**-**
Royalties	-	-	0.1	0.1	-	**-**
Publications	22.4	21.3	21.4	21.4	15.5	**15.5**
Other	1.7	1.6	0.7	0.7	2.7	**2.7**
Revenues Available for Use from Prior Years	-	-	-	-	2.2	**-**
Total Respendable Revenues	**75.2**	**83.3**	**73.5**	**73.5**	**133.7**	**93.1**

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: Resource Requirements by Branch or Sector (millions of dollars)			
2006-2007			
Organization	**Research and Development**	**Technology and Industry Support**	**Total**
Research Institutes			
Main Estimates	498.0		498.0
Planned Spending	*521.3*		*521.3*
Total Authorities	613.0		613.0
Actuals	**530.1**		**530.1**
Industrial Research Assistance Program			
Main Estimates		144.5	144.5
Planned Spending		*143.3*	*143.3*
Total Authorities		172.2	172.2
Actuals		**157.6**	**157.6**
Scientific and Technical Information			
Main Estimates		48.2	48.2
Planned Spending		*47.8*	*47.8*
Total Authorities		57.4	57.4
Actuals		**52.6**	**52.6**
Technology Centres			
Main Estimates		1.7	1.7
Planned Spending		*1.7*	*1.7*
Total Authorities		2.0	2.0
Actuals		**1.9**	**1.9**
TOTAL			
Main Estimates	498.0	194.4	692.4
Planned Spending	*521.3*	*192.8*	*714.1*
Total Authorities	613.0	231.7	844.7
Actuals	**530.1**	**212.0**	**742.1**

Table 3-7A: User Fees

				2006-2007					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	$265	$265	$160,650 This cost includes the salary of the ATIA Coordinator and ATIA Officer 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 received 53 access to information requests; 33 consultations from other government departments. NRC routinely waives fees in accordance with TBS guidelines.	2007-2008	$750	$200,000
									2008-2009	$750	$200,000
									2009-2010	$750	$200,000
			Total			$160,650		Total		$2,250	$600,000
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 2006-2007 included application fees only.											

[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 3-7B: 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
- The Certified Reference Materials Program jointed operated by NRC-INMS and NRC-IMB

Supplementary information on Service Standards for External Fees can be found at http://www.tbs-sct.gc.ca/rma/dpr3/06-07/index_e.asp.

Table 3-8: Details on Project Spending (millions of dollars)

Supplementary information on Project Spending can be found at http://www.tbs-sct.gc.ca/rma/dpr3/06-07/index_e.asp.

Table 3-9: Details on Transfer Payments Programs (TPPs)

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

Further information on these projects can be found at http://www.tbs-sct.gc.ca/rma/dpr3/06-07/index_e.asp.

Table 3-10: 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, 2007. 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 NRC. The purpose of the FSD&A is to enhance the reader's understanding of NRC's financial position and results of operations. Additional information on NRC's performance is available in the NRC Departmental Performance Report for 2006-07.

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 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 is a challenge in itself, as NRC is still required to use the modified cash method of accounting to report on certain financial results to the Government of Canada.

Fiscal year 2006-07 is the second year for NRC to have its financial statements 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. This is the first year that NRC's audited financial statements will be comparative.

NRC Strategy 2006-2011

NRC's strategy – *Science at Work for Canada* – was approved by NRC Council in March 2006 and covers a five-year period beginning April 1st, 2006.

NRC's vision is to be valued as the world's best national organization for research and innovation. NRC's purpose is to be a critical instrument of the federal government, translating science and technology into social and economic well-being for Canada.

NRC has identified three goals to enable NRC to achieve its vision. The first goal is to contribute to the global competitiveness of Canadian industry in key sectors and to the economic viability of communities. The second is to strengthen Canada's innovation system. The third is to make significant contributions to Canada's priorities in health and wellness, sustainable energy and the environment – areas critical to Canada's future.

To meet these goals for Canada, NRC has developed a strategy comprising four key thrusts. The first key thrust is to anticipate and perform research and development that improves the global competitiveness of Canadian industry. The second is to provide integrated industry support that engages key players. The third is to invest in and focus NRC's unique strengths and competencies on areas of importance to Canada. The fourth is to build a sustainable and agile national research and innovation organization for Canada.

NRC will measure its progress in managing and implementing this strategy using a dedicated performance management framework. NRC is currently in the process of implementing its new program structure and performance measurement framework to support this strategy.

NRC will develop specific measures for both its overall vision, as well as each of its defined goals, providing a firm basis for planning and managing operations in pursuit of milestones and key outcomes. Specific measures of NRC's performance management and reporting system will be adjusted to reflect theses new goals and strategies, allowing NRC to report on its achievements and outcomes in implementing its plans.

Governance

In keeping with the broad government goal of improved management in the public sector and the NRC Strategy for 2006-2011, NRC has continued to implement a number of initiatives to improve its corporate governance.

The Council Executive Committee has initiated a review of the role of Council, and it monitors the Council Audit, Evaluation and Risk Management, and Human Resources Committees to ensure these bodies are functioning in a manner that is consistent with their terms of reference and the mandate assigned to them by Council. The Council has also established special task forces to provide NRC with advice on strategic issues such as intellectual property management and the role of NRC in the broad Canadian innovation eco-system.

As part of the NRC Strategy, NRC Senior Executive Committee (SEC) established a Strategy and Priorities Committee (SPC) in 2005-06 that continues to provide senior management with ongoing advice on NRC priorities and strategic direction.

NRC uses portfolio management for its research institutes and programs. Under this structure, the Vice-Presidents play a key role in setting the strategic direction of the institutes within their portfolio and allocating resources to major priorities. Use of the portfolio management approach has improved NRC's ability to undertake and manage cross-institute projects, as well as to ensure that research is well aligned with NRC's corporate vision and strategic priorities.

In 2005-06, 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. In 2006-07, in support of the CFO model, NRC completed the centralization of the finance function initiated in the previous year, placing financial advisors in each Vice-President's portfolio and requiring sign-off of financial information by each responsible manager. The full implementation of these changes will result in even greater accountability at all levels in the organization for sound financial management.

NRC continues to use a rigorous cycle for the planning and review of spending and revenue, which was implemented in 2005-06.

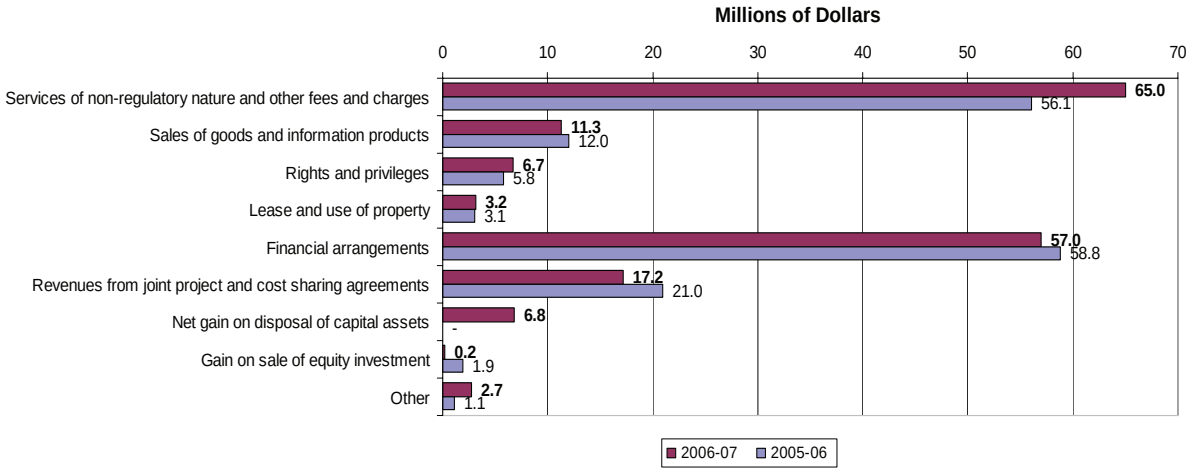
In 2006-07, NRC reinvigorated its internal audit function in accordance with the new Treasury Board of Canada Secretariat Internal Audit Policy by creating and staffing a Chief Audit Executive that reports directly to the President. Two vacant Audit Manager positions were subsequently filled with experienced and accredited professionals. Also in keeping with the new audit policy, NRC is moving actively to ensure its Audit Committee members are appointed by Treasury Board.

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's revenue growth rate was 6.4% in 2006-07, with revenues rising from $159.9 million in 2005-06 to $170.2 million in 2006-07. This growth was primarily due to increased revenue from the provision of services of a non-regulatory nature. This services revenue grew to $65 million in 2006-07 from $56.1 million in 2005-06. The key contributors responsible for this growth were the NRC-Institute for Biological Sciences (NRC-IBS), the NRC-Centre for Surface Transportation Technology (NRC-CSTT), the NRC-Herzberg Institute of Astrophysics (NRC-HIA), the NRC-Canadian Hydraulics Centre (NRC-CHC) and the Administrative Services and Property Management (ASPM) Branch. Further details can be found in the Financial Analysis section of this report under Revenue.

The breakdown of NRC revenue by type for 2006-07 and 2005-06 is as follows:

Revenue by Type



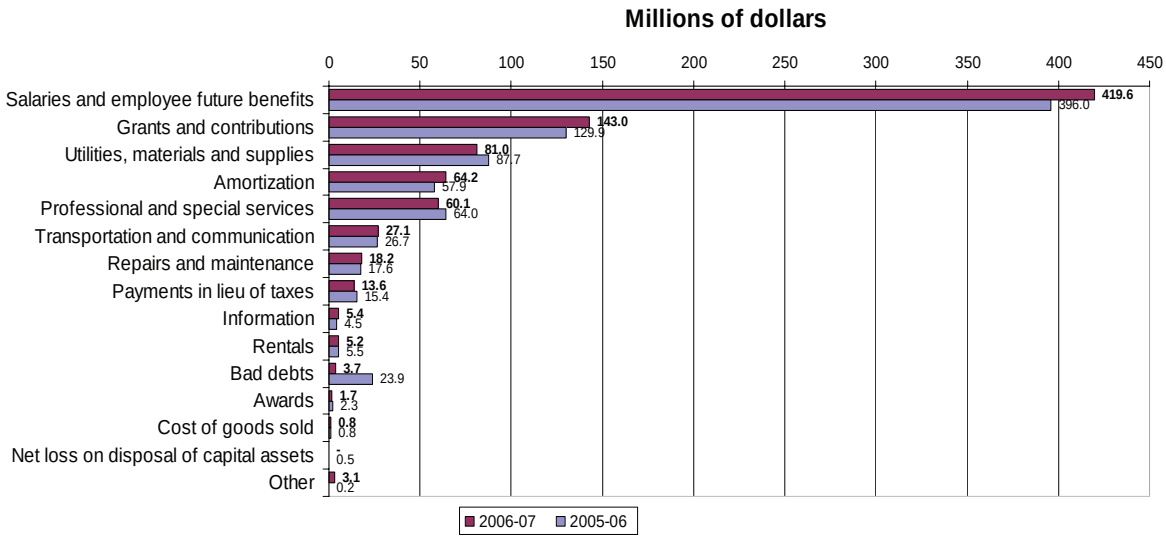
Expenses

NRC's expenses in 2006-07 were $846.7 million, compared to $832.8 million in 2005-06, which represents an increase of 1.7%. Of this, approximately 49.6% represented salary and benefits costs, compared with 47.5% in 2005-06. Grants and contributions costs totaled $143 million in 2006-07, with most of this funding going to small- and medium-sized enterprises (SMEs) through the NRC-Industrial Research Assistance Program (NRC-IRAP). Grants and contributions totaled $129.9 million in 2005-06.

The increase in expenses was mostly the result of a $23.6 million increase in salaries and employee future benefits offset by decreases in utilities, materials and supplies as well as professional and special services. The increase in salaries and employee future benefits is attributable to the Research Council Employees' Association pay equity settlement in 2006-07 and also the retroactive salaries and benefits related to three collective agreements ratified in May 2007, which were not present in 2005-06. An increase in staff levels to meet increased accountability requirements and revenue work also contributed to the rise in expenses. The increase in grants and contributions and the decrease in bad debts in 2006-07 are primarily related to an unusual bad debt adjustment to the 2005-06 IRAP-TPC repayable contributions that occurred as a result of a major follow-up exercise in that year. No significant adjustments were necessary in the follow-up of these repayable contributions during the current fiscal year. In addition, the amortization expense increased by $6.3 million in 2006-07. Further details can be found in the Financial Analysis section under Accounts Receivable and Expenses.

The significant categories of expenses for 2006-07 and 2005-06 are as follows:

Expenses by Type



FINANCIAL RISK AND UNCERTAINTY

NRC faces significant budget constraints from both internal and external pressures.

As a federal government departmental corporation, NRC funds the majority of its salary, operating and capital expenditures 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 impact of rising costs related to property taxes and utilities is significant for NRC.

NRC owns and manages 186 specialized buildings that comprise approximately 524,028 square meters of space. It also has an equipment and informatics base of approximately $202.8 million ($194.7 million in 2005-06) net book value. NRC's capacity to fund the upgrade or replacement of these assets from its appropriations is limited, and it will need to secure sources of funding external to NRC for this purpose.

In addition, since 2004, the federal government has 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 has been significant and challenging. The cumulative reductions to date have amounted to $20.4 million, with a minimum expected ongoing reduction of $12.9 million per year. On a short-term basis, NRC has had to manage these reductions by reducing investments in certain programs of a corporate nature.

To help position itself to meet these challenges, NRC implemented changes in 2005-06 and 2006-07 in its governance structure and made significant progress towards a new, focused business strategy (as detailed in the Highlights section). 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.

NRC is undertaking a thorough resource allocation review to ensure research in priority areas defined in its strategy is appropriately funded in the future. Significant organizational efforts to find sustainable ways to address budget pressures are underway. Many possible avenues are being explored including the re-alignment of programs, increased income generation, efficiency and cost savings, and positioning NRC for new strategic funding. Efforts to engage the Minister of Industry and central agencies on this issue are continuing.

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

Sunsetting Funding

In order to ensure value for money, Treasury Board's practice is to provide funding for new initiatives on a sunsetting basis. This means that rather than providing a permanent increase in the NRC allotment, the government allocates funding for a limited period of time, with the option for renewal. Renewal is conditional on performance, linkages to priorities and availability of funding. While this is recognized as a good management practice for the government as a whole, it creates an elevated level of uncertainty and instability in a research organization such as NRC.

Although funding is not necessarily provided on an ongoing basis, new government-approved initiatives, such as the establishment of technology cluster sites in communities 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 that support these new initiatives, and in some cases invest in them, that they will exist beyond the particular funding window. These challenges add complexity to the organization's planning, budgeting and operations.

Foreign Currency

NRC purchases roughly $50 million per year in goods and services in currencies other than the Canadian dollar, which exposes NRC to fluctuations in foreign exchange. The majority of foreign purchases (88% on average over the last four years) are transacted in U.S. dollars. Due to the strengthening of the Canadian dollar over the last year, NRC has benefited from an increase in purchasing power over 2003-04 levels of approximately U.S. $5 million. A continued upswing of the Canadian dollar relative to the U.S. dollar will benefit NRC's purchasing power, whereas a future decline in the Canadian dollar will have the opposite effect.

The 2006-07 gain in purchasing power was somewhat negated by the reduction in Canadian dollars received from foreign sales. In 2006-07, NRC received Cdn $33.8 million on sales of U.S. $29.5 million. By way of comparison, in 2003-04, NRC received Cdn $35.9 million from U.S. $26.5 million in sales.

Dependence on Revenue

NRC's dependence on external sources of funding has been growing since the early 1990s. The portion of NRC's operating and capital expenditures funded from external sources of income was roughly 11% in 1991-92. In 2006-07, this percentage had climbed to over 17 %.

In particular, NRC maintains technology centres that rely on external sources of revenue to fund the majority of their operations, namely the NRC-Centre for Surface Transportation (NRC-CSTT) and the NRC-Canadian Hydraulics Centre (NRC-CHC). In addition, NRC's two largest institutes – the NRC-Institute for Aerospace Research (NRC-IAR) and the NRC-Canada Institute for Scientific and Technical Information (NRC-CISTI) – rely on external sources of revenue to fund over 40% 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 of science, technology and innovation. 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, health and wellness, and other priority areas outlined in the business strategy.

FINANCIAL ANALYSIS

The following is an analysis that explains the meaning of certain financial statement items unique to the federal government, and provides reasons for significant variances between 2006-07 and 2005-06.

ASSETS

Due from Consolidated Revenue Fund

This amount represents an amount of cash that NRC is entitled to draw from the federal government treasury. This includes cash to discharge its liabilities for which NRC has already received an appropriation, as well as revenue received but not spent.

The $30.9 million increase in this account between 2005-06 and 2006-07 is mainly due to the increase in revenue available for use in subsequent years.

Accounts Receivable

IRAP- TPC Repayable Contributions

The NRC-Industrial Research Assistance Program (NRC-IRAP) 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 small-

and medium-sized enterprises (SMEs) to support the pre-commercialization phase of their technology development. This conditional repayment program in most cases requires 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 its 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, NRC has received repayments amounting to approximately 20% of contributions disbursed as at March 31, 2007 (17% – 2006). With over 300 projects still being administered, this percentage is expected to increase over the next decade.

The IRAP-TPC accounts receivable as at March 31, 2007 were $10.7 million ($7.6 million - 2006) with a corresponding allowance for doubtful accounts of $7.1 million ($6.7 million - 2006).

IRAP-TPC Accounts Receivable

($ in millions)	*2006-07*	*2005-06*
Balance, beginning of year	7.6	1.0
o New invoices	14.2	35.6
o Payments received	(8.5)	(11.4)
o Write-offs	(2.6)	(17.6)
Balance, end of year	10.7	7.6

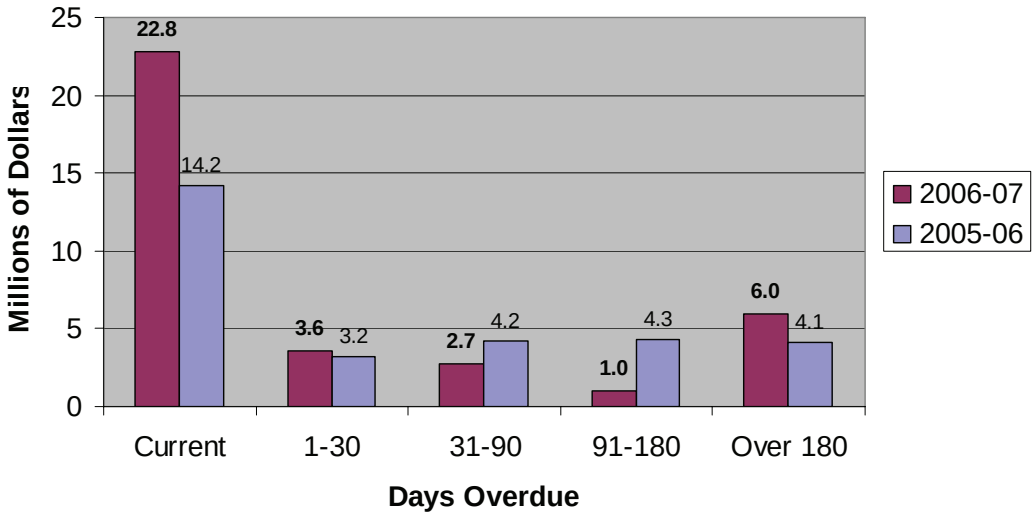
In 2006-07, NRC continued to assess all active contribution agreements to determine if the repayment phase conditions had been met. This major initiative had started during 2005-06 when substantial IRAP-TPC amounts were written off as they represented the value of the debt relating to firms that had ceased operations over the last few years.

Trade Receivables and NRC - IRAP Audit Recoveries

NRC had accounts receivable with external clients worth $19.6 million on its books as at March 31, 2007 ($18.6 million - 2006) with a corresponding allowance for doubtful accounts equal to $2.2 million ($2.0 million - 2006). This amount represents receivables for work done with external clients as well as receivables for audit findings for NRC-IRAP. Write-offs in 2006-07 were $603 thousand ($637 thousand in 2005-06), which is quite low given the value of NRC revenue.

Aged Accounts Receivable

The aging of all accounts receivable as at March 31 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. Inventory for resale decreased by $716 thousand (20%) over 2006 closing values due to the creation of an allowance for obsolete inventory of $600 thousand.

Capital Assets held for Sale

At March 31, 2006, NRC occupied 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 for $15 million. The disposal occurred in 2007 and these proceeds were recognized in 2006-07, resulting in a gain of $7.4 million. NRC does not hold any other capital asset for resale.

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 its laboratories and Industrial Partnership Facilities. Since these companies are very often in their infancy and cannot afford to pay the full cost of the assistance received, 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. It is not management's intention to hold equity investments over the long-term. The NRC will consider timely opportunities for divestiture of equity investments by taking into account the interests, market liquidity and expected

future growth of the company as well as NRC's desire to receive a fair return on the investment on behalf of Canadians.

The full value recorded on the statement of financial position reflects NRC's investment in publicly-traded companies as its 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 Statements	Market Value at March 31, 2007
PharmaGap Inc.	1,305,425	$ 392,933	$ 261,085
Chemaphor Inc.	1,260,305	$ 252,061	$ 441,107
ACE Aviation Holdings Inc.	33	$ 743	$ 1,005
Pure Energy Visions Corp.	210,000	$ 1	$ 53,550
Lions Petroleum Inc.	1,050	$ 1	$ 545
Total	2,776,813	$ 645,739	$ 757,292

The decrease in equity investments of $409 thousand (39%) from 2005-06 to 2006-07 is attributable to the sale of all JDS Uniphase shares on which NRC realized a gain of $142 thousand.

Holmes Fund Investments

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 covers a one- or two-year period and provides the opportunity to post-doctoral students to study at world famous graduate schools or research institutes under outstanding researchers. In 2006-07, NRC granted $95 thousand to the recipient of the 2005 NRC H.L. Holmes Award winner, who received a total of $200 thousand, ending in September 2007. The recipient is using the award to fund two years of collaborative research at the University of Toronto and the Max Born Institute in Berlin, Germany.

Prepaid Expenses

Prepaid expenses increased from a total of $5.5 million as at March 31, 2006 to $12.8 million as at March 31, 2007. The $7.3 million increase between 2005-06 and 2006-07 is mainly due to the increase in prepaid expenses of subscriptions and prepaid expenses of payments in lieu of taxes.

Subscriptions

The NRC-Canada Institute for Scientific and Technical Information (NRC-CISTI) is Canada's science library. It subscribes to many of the world's major scientific and technical journals and databases. Prepaid expenses for subscriptions increased from $3.4 million in 2005-06 to $9 million in 2006-07, due primarily to a more accurate and precise method for tracking the prepaid portion of these subscriptions.

Payments in Lieu of Taxes

The City of Montreal changed its billing process in 2006-07 to require one installment covering the full year of taxes, which resulted in an increase of $844 thousand in the prepaid portion of the property taxes for the NRC-Institute for Aerospace Research (NRC-IAR) and the NRC-Biotechnology Research Institute (NRC-BRI) in Montreal.

Capital Assets

Capital assets increased by 9% from a total cost of $1,195 million in 2005-06 to $1,307 million in 2006-07. This $112 million increase is attributable to $120 million in acquisitions, offset by $8 million in transfers, disposals and write-offs.

Acquisitions

NRC spent $62.1 million on capital expenditures during 2006-07, an amount somewhat lower than the $74.3 million spent in 2005-06. The main reason for this reduction is the completion in 2006-07 of a new laboratory for the NRC-Institute for Fuel Cell Innovation (NRC-IFCI) on the campus of the University of British Columbia (UBC). NRC spent $1.7 million on this facility in 2006-07, compared to $13.5 million in 2005-06.

The following represents the significant capital assets expenditures of 2006-07:

- NRC incurred expenditures on its NRC-Institute for Aerospace Research (NRC-IAR) for alterations and betterments of the Advanced Manufacturing and Technology Centre building in Montreal ($1.7 million) and on its NRC-Institute for Microstructural Science (NRC-IMS) building in Ottawa ($1 million) for the relocation of the laboratories and offices of the Quantum Physics Group.

- Approximately $40 million was expended on machinery, equipment, furniture and informatics equipment in 2006-07. The significant purchases were:

    - Chiller replacements worth $667 thousand in order to provide a comfortable work environment for occupants and suitable temperature and humidity levels for informatics facilities in M-55 at the NRC-Canada Institute for Scientific and Technical Information (NRC-CISTI).
    - E-infostructure worth $990 thousand for the NRC-Canada Institute for Scientific and Technical Information (NRC-CISTI). The Canada Scientific Infostructure concept embodies the development of sophisticated information technology applications and infrastructure and rich information content supported by intelligent search and analysis tools.
    - Completion of construction and renovations at the NRC-Institute for Aerospace Research (NRC-IAR) in Montreal costing $1.1 million and $559 thousand respectively.
    - A Ground Effect Simulation System for the NRC-Institute for Aerospace Research (NRC-IAR) costing $506 thousand. NRC-IAR also paid $3 million for fiber placement of composite materials.

- Additional expenditures to the 3-Tesla Magnetic Resonance Imaging System for the NRC-Institute for Biodiagnostics (NRC-IBD) valued at $549 thousand for a total asset value of $4.2 million.
- A $1 million energy retrofit project at the NRC-Institute for Chemical Process and Environmental Technology (NRC-ICPET).
- A Waters Quadrupole Time-of-Flight Mass Spectrometer System costing $680 thousand for the NRC-Institute for Marine Biosciences (NRC-IMB). The instrument permits the analysis of highly complex biological samples with high accuracy.
- A beach replacement in the Offshore Engineering Basin for the NRC-Institute for Ocean Technology (NRC-IOT), valued at $684 thousand.
- Replacement of skylights costing $587 thousand for the NRC-Industrial Materials Institute (NRC-IMI).
- New offices and laboratories worth $1 million at M-50 for the NRC-Institute for Microstructural Sciences (NRC-IMS).
- A LTQ-Orbitrap Hybrid Mass Spectrometer costing $578 thousand for the NRC-Institute for National Measurement Standards (NRC-INMS).
- A Material Science Transmission EM and a Soft Material Transmission EM for the NRC-National Institute for Nanotechnology (NRC-NINT) costing $900 thousand and $1 million respectively.
- An Inductively Coupled Plasma system for the NRC-Steacie Institute for Molecular Sciences (NRC-SIMS), valued at $523 thousand.

- A further $2.4 million was expended for leasehold improvements at the NRC-National Institute for Nanotechnology (NRC-NINT) in 2006-07, bringing the total to $8 million. In addition, an amount of $733 thousand was expended for leasehold improvements at the NRC-Institute for Nutrisciences and Health (NRC-INH) in 2006-07.

There were $58.1 million of additions in leased capital assets in 2006-07:

- On May 23, 2006, NRC took possession of a new facility and entered into a non-monetary transaction with the University of Alberta (UofA) for the housing of the NRC-National Institute for Nanotechnology (NRC-NINT). The leased property is provided to NRC at a nominal cost of one dollar per year. The building was recorded as a leased capital asset at its fair value of $44.4 million. The annual amortization of the capital asset of $1.8 million is exactly offset by the amortization of the deferred contribution related to the leased building.

- On September 1, 2006, NRC took possession of a new facility and entered into a non-monetary transaction with the University of Prince Edward Island (UPEI) for the housing of the NRC-Institute for Nutrisciences and Health (NRC-INH). The leased property is provided to NRC at a nominal cost of one dollar per year. The building was recorded as a leased capital asset at its fair value of $13.7 million. The annual amortization of the capital asset of $548 thousand is exactly offset by the amortization of the deferred contribution related to the leased building.

Transfers, Disposals and Write-offs

The leasehold improvement for the previous lease of NRC-National Institute for Nanotechnology (NRC-NINT) was disposed of during 2006-07 for a cost of $2.5 million. The remaining balance is composed of disposals and write-offs of various machinery, equipment, furniture and informatics equipment.

LIABILITIES

Accounts Payable and Accrued Liabilities

The accounts payable and accrued liabilities increased by $7.4 million in 2006-07. This increase is mainly attributable to events subsequent to year-end for liabilities incurred at March 31, 2007, for example, the liabilities related to the retroactive portion of the salaries and benefits for the three collective agreements signed in May 2007.

Vacation Pay and Compensatory Leave

This amount varied by 8% from last year, representing an increase of $2.8 million, mostly due to an increase of accumulated vacation pay. The vacation pay liability increased by 7% ($2.7 million) from $36.4 million in 2005-06 to $39.1 million. This increase is mainly attributable to the fact that some collective agreements do not impose any maximum year-to-year carry forward of accumulated vacation due to the nature of the operations at NRC.

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. At the end of 2006-07, this amount totaled $13.1 million, representing a slight increase of 4% over the previous year.

Other

Other deferred revenue consists primarily of research press deferred revenue, as well as conference and seminar registration deferred revenue. However, for 2005-06, it also included deferred revenue on disposition of capital assets held for resale.

NRC had other deferred revenues of $9.2 million at March 31, 2007 compared to $23.6 million at March 31, 2006. This decrease over 2005-06 is mostly related to the $15 million in proceeds related to the disposition of the University of British Columbia (UBC) building for the relocation of the NRC-Institute for Fuel Cell Innovation (NRC-IFCI). 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

million. At March 31, 2006, this $15 million was paid to NRC in advance and established as deferred revenue. As the transaction was completed in 2006-07, the amount has been removed from deferred revenue and recorded against the sale of the asset.

Research Press - The NRC-Canada Institute for Scientific and Technical Information (NRC-CISTI) publishes research journals that 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.

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 Assets

NRC took possession of two new facilities in 2006-07, the first with the University of Alberta (UofA) in May 2006, and the second with the University of Prince Edward Island (UPEI) in September 2006. In addition to the University of Western Ontario (UWO) capital lease, which was present in 2005-06, the two new facilities are leased for $1 per year. Therefore, for each capital lease, 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

This represents amounts payable to employees as allowance for severance pay. The $3.5 million variance compared to 2005-06 represents the difference between the new costs accumulated during 2006-07 less the benefits actually paid during the year.

Environmental Liabilities

An environmental liability was established for $300 thousand for a contaminated site in 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. This amount has not changed from the previous year and there is no other environmental liability.

REVENUES

As previously stated in the Highlights section, NRC's revenues for 2006-07 were $170.2 million as compared to $159.9 million in 2005-06. This growth was primarily led by the increase in services of a non-regulatory nature revenues, as they increased from $56.1 million in 2005-06 to $65 million in 2006-07.

Services of a Non-Regulatory Nature and Other Fees and Charges

In 2006-07, 38% of NRC revenues ($65 million) were generated from services of a non-regulatory nature, which primarily consists of research services provided directly to industry and academic

clients. This compares to $56.1 million or 35% of total revenues in 2005-06. In 2006-07, the NRC-Institute for Aerospace Research (NRC-IAR) and the NRC-Canada Institute for Scientific and Technical Information (NRC-CISTI) accounted for over 46% of NRC's service revenues, compared to 56% in 2005-06.

Much of the increased service revenues in 2006-07 were generated by several NRC institutes who are not traditionally high revenue earners, namely the NRC-Institute for Biological Sciences (NRC-IBS), the NRC-Herzberg Institute for Astrophysics (NRC-HIA) and the Administrative Services and Property Management Branch (ASPM). This service revenue growth was generated from several significant research projects with industry, which brought in an additional $3 million for NRC-IBS and $1.95 million for NRC-HIA. ASPM earned an additional $1.86 million attributable to conference registrations. As NRC continues to develop its relationships with industry, it is expected that services revenues will continue to grow in institutes that have not traditionally been high revenue earners.

Growth in revenues also occurred for NRC's two technology centres, which are very much focused on the provision of services to industry and other government departments. At the NRC-Centre for Surface Transportation Technology (NRC-CSTT), there was an increase of $1.2 million due to a large project in the Rail Division and at the NRC-Canadian Hydraulics Centre (NRC-CHC), there was an increase of $1.2 million due to a general increase in the number and value of contracts with private industry clients.

Sales of Goods and Information Products

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 $11.3 million in 2006-07 and $12 million in 2005-06. This decline was due to reduced sales of NRC-Canada Institute for Scientific and Technical Information's (NRC-CISTI) journals, monographs and other publications.

Rights and Privileges

Royalty revenue is earned from companies that license the rights to use NRC technology. Royalties are typically based on a percentage of the licensee's sales. In 2006-07, NRC generated $6.7 million in royalties, up from $5.8 million in 2005-06. Of this total, $3.5 million ($3.8 million in 2005-06) was earned from the NRC-Institute for Biological Science (NRC-IBS), primarily for the license of the Meningitis C vaccine.

Lease and Use of Property

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 $3.2 million in 2006-07, compared to $3.1 million in 2005-06.

Financial Arrangements with Other Government Departments

NRC undertakes research on behalf of other government departments, referred to as Financial Arrangements. The incremental costs associated with this work are reimbursed. In 2006-07, the amount of work undertaken for other government departments was significant, totaling $57 million ($58.8 million in 2005-06). Most of this work was with the Department of National Defense ($24.8 million in 2006-07, $25.2 million in 2005-06) and Natural Resources Canada ($7.2 million in 2006-07, $7.3 million in 2005-06). Also included in the Financial Arrangements revenue is $15 million ($18.8 million in 2005-06) from Industry Canada through Technology Partnerships Canada (TPC). This amount was received by NRC as part of a repayable contribution program and was used to provide contributions to firms ($11.6 million in 2006-07, $16.2 million in 2005-06) and to cover operating costs associated with the program ($3.4 million in 2006-07, $2.6 million in 2005-06). As the IRAP-TPC program terminated on March 31, 2006, only existing contracted projects will continue.

Revenues from Joint Project and Cost Sharing Agreements

NRC also receives income through collaborative research projects that involve cost sharing arrangements for work that is likely to lead to new expertise or technology. In 2006-07, collaborative funding across all sectors at NRC earned a total of $17.1 million. This was a decrease of 18% from the $21.0 million earned in 2005-06, largely due to the end of a major project with Genome Atlantic in early 2007.

Net Gain on Disposal of Capital Assets

NRC's revenues were also significantly affected by a gain on the sale of capital assets held for resale of $7.4 million. On December 12, 2002, the NRC reached an agreement with the University of British Columbia (UBC) to relinquish an existing land lease and the building thereon for $15 million. As indicated above under Deferred Revenue – Other, the disposal occurred in 2007 and these proceeds were recognized in 2006-07, resulting in a gain of $7.4 million. This gain has been offset by a loss on disposal of capital assets of $546 thousand.

EXPENSES

As noted in the Highlights section, NRC's expenses increased from $832.8 million in 2005-06 to $846.7 million in 2006-07, of which approximately 49.6% (47.5% in 2005-06) represented salary and benefits costs. The increase in expenses was mostly the result of a $23.6 million increase in salaries and employee future benefits.

Salaries and Employee Future Benefits

The increase in salaries and employee future benefits is mainly attributable to the Research Council Employees' Association pay equity settlement in 2006-07. This amount was paid as compensation for lost wages and interest to all eligible employees who were defined as an NRC employee classified as an AD, CR or ST during the period April 1, 1989 to March 31, 1999. Furthermore, the retroactive salaries and benefits for the three collective agreements ratified in May 2007 amount to $4 million. There was also a general increase in salaries due to annual salary

increases, promotions and new hirings to meet increased accountability requirements and increased revenue work. This is indicative of typical variations in NRC's staffing levels from year to year.

Grants and Contributions

Grants and contributions expenses totaled $143 million in 2006-07, compared to $129.9 million in 2005-06. Most of this funding was allocated to small- and medium-sized enterprises (SMEs) through the NRC-Industrial Research Assistance Program (NRC-IRAP). Grants and contributions expenses increased by $13.1 million during fiscal year 2006-07.

The increase in grants and contributions was primarily due to an unusual bad debt adjustment to the 2005-06 IRAP-TPC repayable contributions as a result of the major follow-up exercise that occurred in that year.

The IRAP-TPC program is administered by NRC on behalf of Industry Canada to provide contributions to SMEs to support the pre-commercialization phase of their technology development. Since this program terminated March 31, 2006, there was a decrease of $4.7 million in contributions to firms in 2006-07. The net increase in grants and contributions in 2006-07 is mostly attributable to the accounting treatment of the recovery of these repayable contributions. When the recoveries of the repayable contributions under the IRAP-TPC program are invoiced, these amounts are recognized as a contribution expense recovery and also as a transfer payment expense to Industry Canada for the same amount. However, when a receivable for a repayable contribution is recognized as a bad debt expense, either via the allowance for uncollectibility or as a write-off, the transfer payment expense to Industry Canada is reduced accordingly. As a result of the review undertaken in fiscal year 2005-06, an unusual amount of $24.1 million was recorded as bad debt expense and as a transfer payment recovery. No such unusual adjustment was necessary in fiscal year 2006-07 as the bad debt expense related to the IRAP-TPC program amounted to $2.9 million. Further details can be found in the Financial Analysis section under Accounts Receivable and Bad Debts.

Other factors contributing to the fluctuation of grants and contributions include the decrease of $6.5 million in NRC-IRAP contributions to firms due to the lower availability of contribution funding for this program in 2006-07; the $3.2 million increase in contributions to the international telescopes for new instrumentation; and $1.5 million to the National Laboratory for Particle and Nuclear Physics.

Utilities, Materials and Supplies

The decrease of $6.8 million in utilities, materials and supplies is mainly due to the improved methodology used to calculate prepaid expenses, particularly prepaid subscriptions, as explained in the Financial Analysis section under Prepaid Expenses. Another $1 million of the decrease is attributable to the decline in funding for the Genomics and Health Initiative, which resulted in lower spending in 2006-07.

Professional and Special Services

Professional and special services expenses totaled $60.1 million in 2006-07 as compared to $64 million in 2005-06. This decrease is mostly caused by fewer construction contracts and other services related to assets under construction.

Bad Debts

NRC's bad debt expense decreased from $23.9 million in 2005-06 to $3.7 million in 2006-07. The high bad debt expense in 2005-06 was primarily due to the review of the IRAP-TPC program that was undertaken in 2005-06. This review resulted in a one-time write-down of $17.6 million and an additional allowance for uncollectibility of $6.5 million for a total bad debt expense of $24.1 million related to the IRAP-TPC program. In 2006-07, this bad debt expense related to the IRAP-TPC program represented $2.9 million, as there were no unusual circumstances and all files were up-to-date. Further details can be found in the Financial Analysis section under Accounts Receivable and Grants and Contributions.

Other Expenses

The main reason for the increase in other expenses is the portion of the pay equity settlement related to damages pursuant to the *Canadian Human Rights Act* to all Eligible Employees of the Research Council Employees' Association.

Financial Statements

National Research Council of Canada

March 31, 2007

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, 2007 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, 2007 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.

John Wiersema, FCA
Deputy Auditor General
for the Auditor General of Canada

Ottawa, Canada
June 15, 2007

240 rue Sparks Street, Ottawa, Ontario K1A 0G6

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, 2007 and all information contained in these statements rests with the National Research Council of Canada's (NRC) 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 NRC's financial transactions. Financial information submitted to the *Public Accounts of Canada* and included in the NRC'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 NRC.

The role of the Audit, Evaluation, and Risk Management Committee of the NRC, 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 NRC 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 15, 2007

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

(in thousands of dollars)	2007	2006
ASSETS		
Financial Assets		
Due from the Consolidated Revenue Fund	207,971	177,097
Accounts receivable and advances (Note 4)	26,880	21,089
Inventory for resale	2,873	3,589
Capital assets held for sale (Note 7)	-	7,630
Equity investments (Note 5)	646	1,055
Endowment fund investments (Note 6)	4,192	4,077
	242,562	214,537
Non-Financial Assets		
Prepaid expenses	12,750	5,470
Inventory for consumption	2,111	2,216
Capital assets (Note 7)	601,363	543,824
	616,224	551,510
TOTAL ASSETS	**858,786**	**766,047**
LIABILITIES AND EQUITY OF CANADA		
Liabilities		
Accounts payable and accrued liabilities (Note 8)	130,853	123,471
Vacation pay and compensatory leave	39,791	36,986
Deferred revenue (Note 9)	84,834	42,794
Employee future benefits (Note 10)	58,788	55,269
Environmental liabilities (Note 11)	300	300
	314,566	258,820
Equity of Canada	544,220	507,227
TOTAL LIABILITIES AND EQUITY OF CANADA	**858,786**	**766,047**

Contingent liabilities (Note 11) and contractual obligations (Note 12)

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

Approved by:

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)	**2007**	**2006**
Expenses (Note 13)		
Research and development	600,627	566,534
Technology and Industry support	246,028	266,296
	846,655	832,830
Revenues (Note 14)		
Research and development	109,621	96,363
Technology and Industry support	60,536	63,503
	170,157	159,866
Net Cost of Operations	**676,498**	**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)	**2007**	**2006**
Equity of Canada, beginning of year	507,227	519,055
Net cost of operations	(676,498)	(672,964)
Net cash provided by Government (Note 3)	655,005	624,083
Change in due from the Consolidated Revenue Fund	30,874	11,113
Services received without charge (Note 15)	27,612	25,940
Equity of Canada, end of year	544,220	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)	**2007**	**2006**
Operating Activities		
Net cost of operations	676,498	672,964
Non-cash items		
Amortization of capital assets	(64,210)	(57,916)
Gain on sale of equity investments	223	1,935
Net gain (loss) on disposal of capital assets	6,823	(490)
Services received without charge (Note 15)	(27,612)	(25,940)
Other	2,451	-
Variations in Statement of Financial Position		
Increase (decrease) in accounts receivable and advances	5,791	(4,860)
(Decrease) increase in inventory for resale	(716)	255
Increase in endowment fund investments	115	152
Increase in prepaid expenses	7,280	1,081
Decrease in inventory for consumption	(105)	(202)
Increase in liabilities	(55,746)	(34,864)
Cash used by operating activities	550,792	552,115
Capital Investment Activities		
Acquisitions of capital assets	120,172	74,334
Proceeds from disposal of capital assets	(15,327)	(683)
Cash used by capital investment activities	104,845	73,651
Investing Activities		
Proceeds from sale of equity investments	(632)	(1,683)
Cash used by investing activities	(632)	(1,683)
Financing Activities		
Net cash provided by Government of Canada (Note 3)	(655,005)	(624,083)

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

1. Authority and Objectives

The National Research Council of Canada (the NRC) exists under the *National Research Council Act* and is a departmental corporation named in Schedule II of the *Financial Administration Act*. The objectives of the NRC 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 NRC reports under the following program activities:

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

These program activities also include the NRC'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 NRC is financed mainly by the Government of Canada through Parliamentary appropriations. Appropriations provided to the NRC 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 3 provides a high-level reconciliation between the bases of reporting.

b) Net Cash Provided by Government

The NRC operates within the Consolidated Revenue Fund, which is administered by the Receiver General for Canada. All cash received by the NRC is deposited to the Consolidated Revenue Fund and all cash disbursements made by the NRC 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 (including agencies) of the federal government.

c) Due from the Consolidated Revenue Fund

Due from the Consolidated Revenue Fund represents the amount of cash that the NRC 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 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 NRC.
- 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 NRC's contributions to the Plan are charged to expense in the year incurred and represent the NRC's total obligation to the Plan. Current legislation does not require the NRC 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 NRC becomes aware of the contamination and is obligated, or is likely to be obligated to incur such costs. If the likelihood of the NRC'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 the book value 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 foreign currencies are translated using rates at year end. Gains and losses resulting from foreign currency translation are reported on the Statement of Operations according to the activities to which they relate. Net gains and losses relating to the sale of goods or services in foreign currency are included in revenues. Net gains and losses relating to the purchase of goods or services in foreign currency are included in expenses.

o) Capital Assets and Amortization

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 NRC 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 NRC 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, the liability for employee severance benefits, the allowance for doubtful accounts, the fair value of non-monetary transactions related to leased capital assets 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. Parliamentary Appropriations

The NRC 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 NRC 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)	**2007**	**2006**
Net Cost of Operations	676,498	672,964
Adjustments for items affecting net cost of operations but not affecting appropriations:		
Add (Less):		
Revenues	170,157	159,866
Amortization of capital assets	(64,210)	(57,916)
Financial arrangements with other Federal Government departments and agencies	(56,974)	(58,842)
Services received without charge	(27,612)	(25,940)
Specified purpose accounts disbursements	(17,182)	(20,994)
Increase in salary accruals	(5,527)	-
Employee future benefits	(3,519)	(5,698)
Refunds of previous year's expenditures	3,056	719
Vacation pay and compensatory leave	(2,805)	(3,434)
Increase in litigation claim expense accrual	(1,012)	(538)
Bad debts (expense) recovery	(784)	745
Expenses related to Justice Canada	(541)	(486)
Decrease (increase) in payment-in-lieu of taxes accrual	371	(670)
Loss on disposal of capital assets	-	(490)
Other	3,637	109
Total items affecting net cost of operations but not affecting appropriations	(2,945)	(13,569)
Adjustments for items not affecting net cost of operations but affecting appropriations:		
Add (Less):		
Acquisitions of capital assets and additions to assets under construction	62,072	74,334
Increase in prepaid expenses	7,280	1,081
(Decrease) increase in inventory	(821)	53
Total items not affecting net cost of operations but affecting appropriations	68,531	75,468
Current year appropriations used	742,084	734,863

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

(in thousands of dollars)	**2007**	**2006**
Parliamentary appropriations provided:		
Vote 55 – Operating expenditures	460,203	356,428
Vote 55 – Governor General's special warrants	-	37,877
Vote 60 – Capital expenditures	49,943	53,919
Vote 60 – Governor General's special warrants	-	13,548
Vote 65 – Grants and contributions	145,858	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*	133,706	125,839
Contributions to employee benefit plans	54,647	56,606
Proceeds from the disposal of surplus Crown assets	335	683
Collection agency fees	51	66
Less:		
Revenues available for use in subsequent years	(78,168)	(40,628)
Lapsed appropriations	(24,491)	(10,305)
Current year appropriations used	742,084	734,863

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

(in thousands of dollars)	**2007**	**2006**
Net cash provided by government	655,005	624,083
Revenues	170,157	159,866
Receipts and expenditures not affecting appropriations	(132,918)	(88,658)
(Increase) decrease in accounts receivable and advances	(5,791)	4,860
Increase in endowment fund investments	(115)	(152)
Increase in liabilities	55,746	34,864
Current year appropriations used	742,084	734,863

4. Accounts Receivable and Advances

(in thousands of dollars)	**2007**	**2006**
Accounts receivable from external parties	19,612	18,642
Accounts receivable from other Federal Government departments and agencies	5,846	3,536
Employee advances	48	54
	25,506	22,232
Less: allowance for doubtful accounts on external accounts receivable	(2,180)	(1,969)
	23,326	20,263
Repayable contributions	10,659	7,553
Less: allowance for uncollectibility	(7,105)	(6,727)
Net repayable contributions	3,554	826
Total	26,880	21,089

5. Equity Investments

Equity investments include shares in publicly and privately held companies. It is not management's intention to hold equity investments over the long-term. The NRC will consider timely opportunities for divestiture of equity investments by taking into account the interests, market liquidity and expected future growth of the company as well as NRC's desire to receive a fair return on the investment on behalf of Canadians. Of all portfolio investments where the NRC holds an equity position, six were for debt settlements for a total value of $644,839 (three valued at $537,135 in 2006) and twenty were obtained by non-monetary transactions (twenty-two in 2006), of which eight (eleven in 2006) 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, 2007 was $757,292 ($1,567,687 in 2006).

6. 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)	2007	2006
Restricted cash and investments, beginning of year	4,077	3,925
Net income from endowment	210	232
Awards granted	(95)	(80)
Restricted cash and investments, end of year	4,192	4,077

The portfolio had an average effective return of 5.02% (5.53% in 2006) and an average term to maturity of 5.07 years as at March 31, 2007 (5.21 years as at March 31, 2006). The fair value of the endowment investments as at March 31, 2007 was $4,261,721 ($4,135,889 in 2006).

7. 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	2007 Net book value	2006 Net book value
Land	10,912	-	60	10,972	-	-	-	-	10,972	10,912
Buildings and facilities	579,299	-	35,487	614,786	(293,775)	(23,330)	(13)	(317,118)	297,668	285,524
Works and infrastructure	20,197	-	(12)	20,185	(11,429)	(724)	-	(12,153)	8,032	8,768
Machinery, equipment and furniture	440,175	33,277	(905)	472,547	(270,724)	(28,595)	2,460	(296,859)	175,688	169,451
Informatics equipment	67,647	4,965	(3,847)	68,765	(53,514)	(5,094)	4,090	(54,518)	14,247	14,133
Informatics software	12,239	1,168	3,915	17,322	(3,424)	(3,457)	1	(6,880)	10,442	8,815
Vehicles	2,711	256	(181)	2,786	(1,998)	(239)	170	(2,067)	719	713
Aircraft	10,643	120	-	10,763	(9,020)	(54)	-	(9,074)	1,689	1,623
Leasehold improvements	3,907	-	6,567	10,474	(3,649)	(563)	2,536	(1,676)	8,798	258
Assets under construction	37,027	22,286	(48,751)	10,562	-	-	-	-	10,562	37,027
Leased capital assets	10,000	58,100	-	68,100	(3,400)	(2,154)	-	(5,554)	62,546	6,600
Total	1,194,757	120,172	(7,667)	1,307,262	(650,933)	(64,210)	9,244	(705,899)	601,363	543,824

Amortization expense for the year ended March 31, 2007 is $64,209,615 ($57,915,678 in 2006).

At March 31, 2007, the NRC held eight land lease agreements (eight in 2006) for a nominal annual cost of one dollar with universities. In these instances, the NRC owns the building on the leased land. The fair value of the land for these non-monetary transactions cannot be determined.

On March 21, 1996, the NRC entered into a non-monetary transaction. The NRC 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 NRC for twenty-five years at a nominal cost of one dollar. The NRC has no obligations to the University of Western Ontario other than the relocation of the institute. The property was recorded as a leased capital asset at its fair value of $10,000,000. The annual amortization of $400,000 for the capital asset is exactly offset by the amortization of the deferred contribution related to the leased property.

On May 23, 2006, the NRC took possession of a new facility and entered into a non-monetary transaction with the University of Alberta. The NRC is in the process of re-negotiating terms for a new lease with the University for the housing of the NRC's National Institute for Nanotechnology (NINT), whereby leased property is provided to the NRC at a nominal cost of one dollar per year. The proposed lease provides a one year term with options to renew on ten sequential occasions, each of the first nine renewals to be for a period of five years and the tenth renewal for a period of four years. The building was recorded as a leased capital asset at its fair value of $44,400,000. The annual amortization of $1,776,000 for the capital asset is exactly offset by the amortization of the deferred contribution related to the leased building.

On September 1, 2006, the NRC took possession of a new facility and entered into a non-monetary transaction with the University of Prince Edward Island. The NRC entered into a lease agreement with the University for the housing of the NRC's Institute for Nutrisciences and Health (INH), whereby leased property was provided to the NRC at a nominal cost of one dollar per year. The lease provides a nineteen month term with renewal options for seven additional periods of five years, and one additional period of three years and five months (to August 31, 2046). The building was recorded as a leased capital asset at its fair value of $13,700,000. The annual amortization of $548,000 for the capital asset is exactly offset by the amortization of the deferred contribution related to the leased building.

On December 12, 2002, the NRC reached an agreement with the University of British Columbia to relinquish an existing land lease and the building thereon for $15,000,000. The disposal occured in 2007 and these proceeds were recognized in 2007.

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

(in thousands of dollars)	**Cost**	**Accumulated Amortization**	**2007 Net book value**	**2006 Net book value**
Capital assets held for sale	-	-	-	7,630

8. Accounts Payable and Accrued Liabilities

(in thousands of dollars)	**2007**	**2006**
Suppliers	102,188	98,175
Payable to other Federal Government departments and agencies	14,017	15,339
Accrued salaries, wages and employee benefits	13,773	7,965
Contractor holdbacks	745	865
Sales tax payable	130	1,127
Total	130,853	123,471

9. Deferred Revenue

(in thousands of dollars)	2007	2006
Deferred revenue - specified purpose accounts		
Balance, beginning of year	12,596	11,054
Funds received	17,679	22,536
Revenue recognized	(17,182)	(20,994)
Balance, end of year	13,093	12,596
Deferred revenue - other		
Balance, beginning of year	23,598	12,783
Funds received	9,129	18,614
Revenue recognized	(23,532)	(7,799)
Balance, end of year	9,195	23,598
Deferred revenue – contributions related to leased capital assets		
Balance, beginning of year	6,600	7,000
Contributions received	58,100	-
Contributions recognized as revenue	(2,154)	(400)
Balance, end of year	62,546	6,600
Total	84,834	42,794

10. Employee Future Benefits

Employees of the NRC 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 NRC 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 $40,275,048 ($41,888,165 in 2006) which represents approximately 2.3 times (2.6 times in 2006) the contributions by employees. Both the employees and the NRC contribute to the cost of the Plan. As at March 31, 2007, the contributions are as follows:

(in thousands of dollars)	2007	2006
NRC's contributions	40,275	41,888
Employees' contributions	17,825	15,818

The NRC'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 NRC 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)	2007	2006
Accrued benefit obligation, beginning of year	55,269	49,571
Expense for the year	7,180	8,707
Benefits paid during the year	(3,661)	(3,009)
Accrued benefit obligation, end of year	58,788	55,269

11. Contingent Liabilities

a) Environmental liabilities

Liabilities are accrued to record the estimated costs related to the management and remediation of contaminated sites where the NRC is obligated or likely to be obligated to incur such costs. The NRC has identified one site (one site in 2006) where such action is possible and for which a liability of $300,000 ($300,000 in 2006) has been recorded. The NRC'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 NRC in the year in which they become known.

b) Claims and litigation

Claims have been made against the NRC 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 in the NRC's financial statements.

As at March 31, 2007, the NRC had thirteen claims (seventeen in 2006) outstanding of which three (five in 2006) related to pending charges that will likely result in a liability and two where the outcome is undeterminable (none in 2006). All three claims that will likely result in a liability can be reasonably estimated (four in 2006) and none (one in 2006) cannot be reasonably estimated. A total accrued liability of $1,550,000 ($537,600 in 2006) was recorded based on the NRC's legal assessment of potential liability.

12. Contractual Obligations

The nature of the NRC's activities can result in some large multi-year contracts and obligations whereby the NRC 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)	**2008**	**2009**	**2010**	**2011**	**2012 and thereafter**	**Total**
Transfer payments	92,907	60,540	54,900	10,530	17,295	236,172
Operating contracts	31,542	12,157	8,433	763	-	52,895
Total	124,449	72,697	63,333	11,293	17,295	289,067

13. Expenses

(in thousands of dollars)	**2007**	**2006**
Salaries and employee future benefits	419,566	395,985
Grants and contributions	142,963	129,902
Utilities, materials and supplies	81,026	87,777
Amortization	64,210	57,916
Professional and special services	60,111	64,044
Transportation and communication	27,127	26,667
Repairs and maintenance	18,180	17,616
Payments in lieu of taxes	13,649	15,373
Information	5,377	4,492
Rentals	5,244	5,460
Bad debts	3,658	23,879
Awards	1,707	2,261
Cost of goods sold	745	807
Net loss on disposal of capital assets	-	490
Other	3,092	161
Total	846,655	832,830

14. Revenues

(in thousands of dollars)	2007	2006
Sales of goods and services		
Services of non-regulatory nature and other fees and charges	64,995	56,097
Sales of goods and information products	11,349	11,981
Rights and privileges	6,663	5,834
Lease and use of property	3,221	3,060
	86,228	76,972
Financial arrangements with other Federal Government departments and agencies	56,974	58,842
Revenues from joint project and cost sharing agreements	17,182	20,994
Net gain on disposal of capital assets	6,823	-
Gain on sale of equity investment	223	1,935
Other	2,727	1,123
Total	170,157	159,866

15. Related Party Transactions

The NRC is related as a result of common ownership to all Government of Canada departments, agencies, and Crown corporations. The NRC enters into transactions with these entities in the normal course of business and on normal trade terms. Refer to Note 4 and Note 8 for receivable and payable to other Federal Government departments and agencies. Also, during the year, the NRC received services, which were obtained without charge from other Federal Government departments and agencies. These services without charge have been recognized in the NRC's Statement of Operations as follows:

(in thousands of dollars)	2007	2006
Employer's contributions to the health and dental insurance plans provided by Treasury Board	25,786	24,478
Legal services provided by Justice Canada	635	376
Audit services provided by the Office of the Auditor General of Canada	500	427
Workers' compensation benefits provided by Human Resources and Social Development Canada	360	336
Payroll services provided by Public Works and Government Services Canada	174	163
Accommodation provided by Public Works and Government Services Canada	157	160
Total	27,612	25,940

The total of legal services provided by Justice Canada amount to $1,176,429 ($862,638 in 2006). Of this amount, $635,462 ($376,326 in 2006) was provided without charge.

16. Financial Instruments

The NRC'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 NRC 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.

17. Subsequent Event

In May 2007, the NRC and the Research Council Employee's Association (RCEA) reached a collective agreement with the following three groups: Administrative Support (AD), Administrative Services (AS) and Computer Systems Administration (CS) for the period of May 1, 2005 to April 30, 2008 for the AD and AS groups and for the period of December 22, 2005 to December 21, 2007 for the CS group. All retroactive salaries and benefits payable in accordance with these agreements, which will be funded by the Treasury Board Secretariat, will be paid in 2008. A liability and an expense for retroactive salaries and benefits payable as at March 31, 2007 were recorded in 2007 for $4 million.

18. Comparative Information

Comparative figures have been reclassified to conform to the current year's presentation.

Table 3-11: Response to Parliamentary Committees, Audits and Evaluations for 2006–2007

Response to Parliamentary Committees

NRC did not participate in any Parliamentary Committees in 2006-2007 that required a response.

Response to the Auditor General

Progress in implementing NRC Internal Audit and Office of the Auditor General (OAG) recommendations is reported to the Audit, Evaluation and Risk Management Committee on a quarterly basis. In 2006-2007, the OAG examined progress made by NRC in addressing recommendations from the OAG's 2004 audit of NRC Management of Leading-Edge Research. The OAG noted that NRC has made satisfactory progress overall since 2004 in responding to the previous OAG recommendations. NRC has addressed the recommendations in the areas of corporate governance, corporate strategic direction, and human resources management. However, progress remains to be made in the documenting of key decisions at the institute level and in performance measurement and reporting. The OAG acknowledged that the process of consultation and development of NRC's new strategy has not allowed it to move as quickly as possible on some. With the new NRC Strategy now in place and with the development of the recently approved corporate business plan, NRC should be in a better position to address the remaining issues more directly and more effectively. NRC Internal Audit's tracking of subsequent recommendations made by the OAG in its 2007 report show them to be largely on track.

Link to February 2007 Follow-up Audit by the OAG: http://www.oag-bvg.gc.ca/domino/reports.nsf/html/20070203ce.html

Internal Audits Completed in 2006-2007

Internal Audits

- No internal audits completed in 2006-2007.

Internal Evaluations Completed in 2006-2007

Internal Evaluations

- Evaluation of Central and Western Cluster Initiatives Summary Report
    - Evaluation of Central and Western Cluster Initiatives – Institute for Fuel Cell Innovation
    - Evaluation of Central and Western Cluster Initiatives – Evaluation of the National Institute for Nanotechnology
    - Evaluation of Central and Western Cluster Initiatives – Crops for Enhanced Human Health
    - Evaluation of Central and Western Cluster Initiatives – Centre for the Commercialization of Biomedical Technology
    - Evaluation of Central and Western Cluster Initiatives – Aluminium Technology Centre
    - Evaluation of Central and Western Cluster Initiatives – Canadian Photonics Fabrication Centre
- Evaluation of the Genomics R&D Initiative

The executive summaries for all internal evaluation reports can be found at: 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	Management Response	Progress Made in 2006-2007
The evaluation recommends that NRC-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 NRC-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 NRC-IRAP's contribution budget, NRC-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 NRC-IRAP's value to SMEs and Canada.	NRC-IRAP agrees with the need to increase its level of funding per client for research and development projects; in fact, NRC-IRAP has begun to put this strategy into effect and with the resulting trade-off of reaching fewer clients. As part of its new Strategic Plan and with additional funding, NRC-IRAP is expecting to double its client reach over the next five years (from 12,000 to 24,000 clients by 2007). NRC is requesting additional funding for NRC-IRAP from the Federal Government to ensure that the program can assist more SMEs increase their innovation capabilities over the next few years and is considering innovative approaches to increase the level of funding available per client. NRC-IRAP is also working with other sources of funding such as venture capital, BDC and regional agencies to facilitate SME access to funding for innovation related activities.	The NRC-IRAP delivery network of 230 industry-seasoned program delivery professionals (Industrial Technology Advisors, Innovation and Network Analysts & Business Analysts) deliver three programs directly to SMEs: the flagship NRC-IRAP program, the Youth program (on behalf of HRSDC), and the sun-setting IRAP-TPC program. In general, these delivery professionals do not specialize in delivering one program, but rather draw upon the program that meets the needs of the client on a case-by-case basis. NRC-IRAP's A-base funding for overall grants and contributions decreased in FY 2006-07. For example, in FY 1997-1998 NRC-IRAP contributed $65.4 million to Canadian SMEs. NRC-IRAP's budget for its regular NRC-IRAP program FY 2006-2007 was $55.6 million before one time funding arrangements with Industry Canada ($6.3 million and DEC $2.6 million ($1.2 million for SMEs)) brought the current FY 2006-2007 total to about $63 million. The fact that demand continued at previous levels resulted in NRC-IRAP running out of contributions money early in the year and that same demand is expected to continue in a similar manner in the future. In addition to the wind-down of the funding payment phase of IRAP-TPC program, most regional agencies have been unable to continue directing as much of their funding towards NRC-IRAP, as they were able to do since the late 1990s. A stagnant NRC-IRAP budget allocation and inflationary pressures have gradually eroded the NRC-IRAP's ability to assist SMEs. As a result of the 2006 expenditure review, and given the financial reductions NRC had to make in 2006-2007, the internal allocations for NRC-IRAP were reduced. In view of the foregoing, variations in NRC-IRAP budget levels (e.g., in-year access to sources of funding) and the practice of earmarking funding for a particular region or technology domain has put pressure on the flexibility of this program, which historically has built its strength through responding to client demand. Consequently,

2001-2002 Evaluation of Industrial Research Assistance Program (NRC-IRAP)		
Recommendation	Management Response	Progress Made in 2006-2007
		having access to a stable and predictable budget is paramount to managing NRC-IRAP in the future. NRC-IRAP managed to recoup some of the budget adjustments required as a loss of the regional relationship, and continues to seek out new opportunities left by this gap. For example, in April 2007, NRC-IRAP reclaimed its initial $15 million contribution to the Technology Partnerships Program (TPC) after diligent negotiations with Industry Canada in the previous months. This money was reconstituted into NRC-IRAP's overall budget (the bulk of which was designated to non-repayable contributions) and made more project funds available to our clients. Because of these factors, NRC-IRAP experienced a decline in its funded client reach in 2006-2007, from 2,677 clients in 2005-2006 to 1,906 clients in 2006-2007. However, the Program provided funded assistance to more new clients, from 340 in 2005-2006 to 732 in 2006-2007. Overall, contributions to firms (NRC-IRAP and Youth) declined from $73.31 million in 2005-2006 to $66.09 million in 2006-2007. The new Executive Director of the National Office joined NRC-IRAP in June 2006 and continues to be diligent in accessing already existing funds or seeking out new sources of budget opportunity. A priority is to stabilize NRC-IRAP's budget and build better forecasting tools so the Program can manage its financial assistance aggressively from the start of the each fiscal year. As a result, in 2006-2007 available project funds were closely monitored and shifted between regions in a more timely fashion, based on client demand. This practice ensured maximum use of available Program funds.
NRC-IRAP should closely examine its advisory services to increase their value to clients and their cost-effectiveness. To do this, NRC-IRAP should consider reducing the array of advisory services available and focusing on core services	NRC-IRAP agrees on the importance of this issue and intends to address it over the next few years. NRC-IRAP firmly believes that its value added advice is part of the package of services available to SMEs and difficult to separate out from the process of providing financial or other assistance. The issue for NRC-IRAP is how to record and	NRC-IRAP continued to provide its core competencies - a variety of technical and business oriented advisory services, linkages, referrals and networks along with potential financial assistance to growth-oriented Canadian SMEs. In 2006-2007, approximately 8,000 firms received advisory services from NRC-IRAP of which 1,906 received financial assistance.

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Recommendation	Management Response	Progress Made in 2006-2007
used by clients; building on partnerships to complement NRC-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 NRC-IRAP advice and increasing client awareness of NRC-IRAP advice as a service; and determining the optimal level of resources that should be allocated between NRC-IRAP funding and advisory services to maximize cost-effectiveness.	measure client advice activities to allow an adequate assessment of the results of advice to SMEs. NRC-IRAP's performance measurement framework will be instrumental in addressing this issue.	In September 2005, NRC-IRAP, recognizing it was not adequately resourced to provide the broad spectrum of innovation assistance on its own, adjusted its strategic direction to focus on delivery of NRC-IRAP core competencies. To ensure SMEs continued to have access to other needed support, NRC-IRAP initiated strategic collaborations with other organizations. NRC-IRAP launched new project level technical and commercial performance indicators, which will be monitored in 2007-2012. NRC-IRAP started in 2006 to review its current performance framework and supporting business and IT systems to ensure that it is aligned with its current logic model. For example, NRC-IRAP provides an annual contribution for an initiative with the Canadian Association of Management Consultants (CAMC), which is designed to provide access to up to 3 days of business management advice to eligible SMEs. The program called the Management Advisory Services (MAS), compliments NRC-IRAP's mandate by providing SMEs with professional third-party management service, helping to ensure that technological innovation is commercialized for the benefit of Canadians. During 2006-2007, a total of 80 separate advisory assignments were conducted by Certified Management Consultants (CMCs). Client SMEs rated this program very highly. Fully 100 percent of SME respondents to the survey said that they would recommend the MAS service to other SMEs. An important outcome of this program is that SMEs who have received the service are better prepared to successfully commercialize their technological innovation and to overcome barriers to growth.
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 shared business model that clearly articulates	NRC-IRAP agrees that a nationally shared vision and mission are essential to CTN's success as a national network and that this vision and mission need to be supported by a nationally shared business model that clearly articulates what CTN is about, what activities it undertakes, its resources, its reach, and the benefits to clients and to Canada. NRC-IRAP will	In 2006-2007, NRC-IRAP-Quebec determined that because of significant funds received from DEC as well as other in-kind contributions, it was timely to spin-out its CTN initiative as a not-for-profit organization supported and managed by its members. NRC-IRAP Quebec continues to be a key member of this network which will continue to facilitate current awareness of innovation support

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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).	work with CTN Members, users and enablers of the network to complete this work by December 2003.	programs and services that will expedite fast and effective referral services between members for Quebec SMEs All NRC-IRAP regions continue to provide contributions to organizations, that complement NRC-IRAP's core technical advisory services and provide an array of services to SMEs.
NRC-IRAP should consider improving and increasing NRC-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 NRC-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's new Strategic Plan identifies significant opportunities for increasing partnerships and linkages with key stakeholders to help SMEs access technologies, technical information as well as collaborations with suppliers, customers and other firms. NRC-IRAP is currently working on implementation frameworks to take advantage of these opportunities in a timely fashion and to the benefit of innovation in SMEs.	In December 2004, NRC-IRAP and NRC-CISTI signed a Memorandum of Agreement (MOA) for NRC-CISTI provision of basic information services to NRC-IRAP across Canada during fiscal year 2005-2006. In 2007 the MOA was renewed for years 2007-2010 and shifted the Technical Business Advisors from NRC-IRAP to NRC-CISTI and these two parts of NRC now share the coordination and management of the related services to NRC-IRAP. Along with the consistent national delivery of basic NRC-CISTI information services, NRC-CISTI and NRC-IRAP continued to collaborate at the regional level in the delivery of CTI services in Atlantic/Nunavut, Manitoba and Quebec. This included the launch of a CTI pilot service to a limited number of ITAs in Quebec, the expansion of the CTI services in Atlantic/Nunavut to include Newfoundland and Labrador/Nunavut, and the hiring of a NRC-CISTI Technical Business Analyst (TBA) to work out of the NRC Centre for the Commercialization of Biomedical Technology. <u>Strengthening NRC-IRAP and NRC Institute Relationships</u> In 2006 NRC-IRAP undertook staff consultation to assess the strengths and weaknesses of NRC business processes on their service delivery, as well as the nature of the relationship between ITAs and institute staff. As a result of this initiative several grass root efforts have started or are in the planning stage to build better relationships and processes that will help NRC to achieve its new business strategies related to working with SMEs. These efforts

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Recommendation	Management Response	Progress Made in 2006-2007
		include tours, meetings and workshops. More details can be found in Table 3-9. <u>OGD Relationships</u> NRC-IRAP continues to develop relationships with other government departments. Details can be found in Table 3-9. <u>International Relationships</u> NRC-IRAP Pacific Region is actively involved with Asia, in particular China where NRC-IRAP has three active MOUs with S&T commissions (Shanghai, Beijing and Guangdong). There was a successful Green Technology Ministerial mission to China in January 2007, where a delegation of Canadian firms in the HFC sector participated. Afterwards, there was a broad industry consultation in order to plan joint R&D collaborations involving NRC-IFCI and SMEs. Potential R&D collaborations are presently being discussed.
The evaluation recommends that NRC-IRAP establish national priorities and effectively manage them by identifying what is NRC-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 NRC-IRAP's available resources and selecting those initiatives based on NRC-IRAP's new strategic plan, federal government priorities and a risk assessment; and establishing a comprehensive plan to monitor NRC-IRAP's core business and other initiatives implemented.	NRC-IRAP agrees with the need to clearly identify priorities and will continue to do so based on resources available. To ensure effective resource use for the benefit of SMEs, NRC-IRAP is confirming its core business, associated resources and results in developing implementation frameworks for its Strategic Plan.	In September 2005, NRC-IRAP adjusted its strategic direction in response to the ongoing needs of its clients and their marketplace. In September 2006, the NRC-IRAP Senior Leadership Team (SLT) met for two days to discuss strategic priorities for NRC-IRAP for fiscal years 2006-2007 and 2007-2008. SLT established a 3-year rolling business plan consisting of seven priorities. In addition to NRC-IRAP's on-going commitments of program delivery and development, (execution of the national business plan and coordination of international activity) the Program focused and will continue to work on these seven priorities including: 1. Alignment with NRC Strategy 2. Enhancing Performance Measurements 3. Knowledge Coordination, Gathering and Sharing 4. Needs Assessment and Development of Preliminary Plan on Training and Best Practices 5. Appropriations and Stabilization of the NRC-IRAP Budget 6. Financial Accountability, Forecasting and Clarity 7. Coordination of Evaluations, Audits and Revision of Terms

2001-2002 Evaluation of Industrial Research Assistance Program (NRC-IRAP)		
Recommendation	Management Response	Progress Made in 2006-2007
		and Conditions In 2006-2007, a working document for each of these business plan priorities was prepared, which establishes the scope of the project, determines challenges and opportunities, determines human and financial resources required, and establishes next steps. These working documents will assist each accountable Executive Director in preparing respective work plans and they will form the bases of the integrated NRC-IRAP Business Plan for 2008-2009. NRC-IRAP completed the first of a three-year rolling business plan to address these priorities. During 2006-2007 NRC-IRAP had five different active audits/evaluations, including the Audit of Recipients, the NRC Internal Audit of NRC-IRAP, the Office of the Auditor General Study on Grants and Contributions programs and their Innovation Audit, as well as the NRC Evaluation of NRC-IRAP. Supporting these placed a tremendous stress on the Program delivery staff, as they responded to multiple requests for documents and information by those undertaking the studies. It is highly unusual to have so many ongoing external studies, each with their own information needs and deadlines. NRC-IRAP dedicated significant time and effort in supporting the draft NRC Internal Audit of NRC-IRAP (2006) and subsequent follow up investigation and worked closely with the NRC Internal Audit Group and await receipt of their draft report. In 2006 NRC initiated its evaluation of NRC-IRAP, in preparation for the renewal of the Program Terms and Conditions in 2008. NRC-IRAP staff nationally and regionally contributed significant time and effort in the provision of data and participation in the interviews and focus groups that support this undertaking. Furthermore, NRC-IRAP collaborated with NRC Internal Audit Group and the OAG regarding the OAG Audit on Research and Innovation as well as the federal Study of Grants and Contributions programs. Program staff also worked closely with

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Recommendation	Management Response	Progress Made in 2006-2007
		NRC Corporate staff to scope and implement the NRC-IRAP Evaluation, which continues into 2007-2008.
NRC-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, NRC-IRAP client profiles, NRC-IRAP's budget and priorities, and federal government priorities. NRC-IRAP should strive to have a portfolio that includes attraction of new clients, and ensure that ITAs and NRC-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).	NRC-IRAP agrees with this recommendation. As part of its Strategic Plan, NRC-IRAP is moving towards a client portfolio management approach. Although a portfolio management approach will allow NRC-IRAP to be more proactive in terms of understanding and meeting SME needs for innovation assistance, particularly specific client communities, NRC-IRAP is driven by client demand and its client portfolio approach must reflect the reality of its business with SMEs. NRC-IRAP is also looking to put in place the tools necessary to assist regions and staff in effectively managing and delivering within a portfolio management approach.	The Program's administrative concerns and complex financial policies have been of particular note for the field staff and staff in the support roles. 2006-07 saw the hiring of the Director-General as well as Executive Directors in three regions as well as the National Office, all of which will result in stability and more consistent management to the program. NRC-IRAP managed to recoup some of the budget adjustments required as a loss of the regional relationship. In April 2007, NRC-IRAP reclaimed its initial $15 million contribution to the Technology Partnerships Program (TPC) after intense negotiations with Industry Canada in the previous months. This money was reconstituted into NRC-IRAP's overall budget and made even more project funds available to our clients. In July 2006, NRC-IRAP piloted an initiative on benchmarking clients in NRC-IRAP Pacific region. The objective of this pilot was to develop a benchmarking methodology by using existing Statistics Canada databases to compare growth profiles of SMEs supported financially by NRC-IRAP Pacific with the general population of firms of similar profile to better understand the characteristics of NRC-IRAP's clients. A total of 694 matches were made with databases used. This number was considered sufficiently robust to be a 'population' rather than a 'sample'. This study shows that NRC-IRAP client SMEs in the Pacific Region have a higher percentage growth (employment, payroll and revenue) than SMEs that did not receive assistance from NRC-IRAP. In addition to the increased percentage growth of employment, payroll and revenue, the study also demonstrates that NRC-IRAP clients have a higher performance ratio on shareholder equity, shareholder equity growth, R&D expenditure and R&D personnel. However, the performance ratio on exports was slightly lower for NRC-IRAP clients than SMEs in general. The Senior Leadership Team deemed this analysis valuable for the understanding of the Program and approved a

2001-2002 Evaluation of Industrial Research Assistance Program (NRC-IRAP)		
Recommendation	Management Response	Progress Made in 2006-2007
		similar national benchmarking be undertaken in 2007-2008. In 2006-2007, NRC-IRAP more than doubled its portfolio of new clients compared to the previous year. The Program provided funded assistance to 732 new clients in 2006-2007 compared to 340 in 2005-2006. In 2006 NRC-IRAP was successful with its proposal to SEC to secure $8.3 million over 3 years) of Round II NRC Cluster funding. As a result of this effort, NRC-IRAP has determined that technology cluster support/efforts directed to groups of firms, is a growing part of the Program's business. A strategy was developed, systems were modified accordingly and management will monitor the cluster support activity over the next three years to determine the optimum size of this component of the Program's offerings.
NRC-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 NRC-IRAP clients with access to CTN management expertise/ services.	NRC-IRAP is well aware of the importance for the SME of marketing and management capabilities to the successful completion of the innovation. This has been built into NRC-IRAP's performance framework with indicators to help assess client results in this area. As part of its Strategic Plan, NRC-IRAP is considering how best to provide business and management advice and assistance to SMEs including how CTN might be a resource in this area. NRC-IRAP has begun to provide training and development opportunities to its staff in areas related to business, finance and marketing and plans to continue to do so in a more systematic fashion over the next few years.	NRC-IRAP no longer manages CTN. Through its Program networks and contributions to organizations endeavours, NRC-IRAP continues to ensure needed information and support services are accessible to SMEs.
The evaluation recommends that NRC-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). NRC-IRAP should also ensure that mechanisms are in place to provide adequate time and	NRC-IRAP agrees with this recommendation and has developed a client relationship management system for this purpose. NRC-IRAP must continually balance the need for adequate information for accountability purposes with the need for effective timely advice and services to SMEs. This is also a resource issue, as raised in the recommendation. Having access to client data is critical and NRC-IRAP will continue to work with staff and regions to improve access to quality information in a cost effective manner.	Throughout the year, many significant enhancements were made to Sonar to increase the value of client information to the Program. These changes reflected the actions taken as a result of the 2004 financial due diligence study and recommendations. NRC-IRAP embarked in a Sonar user requirements project, which re-examines the data needs of the Program. NRC-IRAP is in the process of hiring a person for 3 years to oversee this project from the developing phase to the implementation phase and also

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Recommendation	Management Response	Progress Made in 2006-2007
motivation for ITAs to enter information in the client management system (SONAR) and ongoing ITA awareness of NRC-IRAP's performance measurement system.		assessing the impact of NRC's recent purchase of MySap- the client relationship information management module.

2002-2003 Evaluation of the Institute for Chemical Process and Environmental Technology (NRC-ICPET)		
Recommendation	Management Response	Progress Made in 2006-2007
In its current strategic planning exercise NRC-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.	Through its strategic planning, the Institute will create a clear vision in conjunction with goals and strategies tied to a performance framework.	The Institute has reached a point of on-going refinement of its programs, maintaining alignment with NRC priorities through annual review and project selection processes. The number of projects approved for 2007-2008 has been reduced to 12.
NRC-ICPET should seek ways to increase the degree of integration of the research activities within the Institute.	Integration will be accomplished in part as research activities are developed around selected research themes identified in the strategic plan.	Refinement of the matrix approach continues, through sessions with focus groups and clarification of roles and responsibilities, particularly in the case of health and safety management.
NRC-ICPET should seek ways to increase interactions and build stronger ties with industry.	Industry awareness of NRC-ICPET will be increased through several mechanisms.	NRC-ICPET identified leaders for three key application areas and become engaged in research consortia and cluster development activities. A number of collaborative research agreements were signed with companies in the Institute target areas: hydrogen and fuel cells, sustainable energy and environment.
NRC-ICPET should increase its interactions and collaborations with universities.	NRC-ICPET will continue to increase its linkages with universities, as identified in last year's Planning Outlook.	The first annual fuel cell colloquium was organized with the Fuel Cell Research Centre in Kingston (Queen's University and Royal Military College). The Institute organized a hydrogen storage workshop to create a network of Canadian researchers in the area.
NRC-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	The Institute's intent in its planning to focus on specific themes, with applications arising from the themes, will provide a mechanism for effectively managing the research portfolio.	A balance has been achieved by undertaking on-going adjustments through annual review and project selection process.

2002-2003 Evaluation of the Institute for Chemical Process and Environmental Technology (NRC-ICPET)		
Recommendation	Management Response	Progress Made in 2006-2007
research		
NRC-ICPET should seek ways to increase its visibility and raise its profile, both outside of and within NRC.	As described in the response to Recommendation 1(a), improving the Institute's focus will facilitate its efforts to increase its profile and recognition.	This is an on-going process, with Institute staff on NRC committees, federal government S&T committees, advisory boards of organizations promoting innovation and sector specific R&D.
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.	In the strategic planning done thus far, NRC-ICPET has identified "building commercialization capacity" as a potential strategic theme to be pursued.	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 (STO) 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.	Sustainable technologies and systems are expected to be central to the Institute's future, and the development of tools to assess sustainability aspects of technologies will be factored into NRC-ICPET's strategic planning process. A wider STO role, such as facilitation, support, and promotion of sustainable technologies beyond NRC-ICPET will require a clear NRC mandate and resource framework.	With the disbandment of the Sustainable Technology Office, there is nothing further to report.

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	Progress Made in 2006-2007
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.	During the fiscal year ending March 31, 2007, TRIUMF received application from the University of Montreal for admission to the TRIUMF Joint Venture and letters of enquiry from the University of Manitoba regarding the possibility of joining 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	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	TRIUMF continues to be the unique facility in the world for this kind of science and continues to have more internationally peer-reviewed requests for experimental beam time at the ISAC facility than it can fulfill. Scientists in Canada and from the international community wishing to use the TRIUMF ISAC facilities find the long waits required for experimental beam time frustrating. TRIUMF has only one beam line to the ISAC facilities, which must serve the experimental

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	Progress Made in 2006-2007
catering to a broad international users community, and o participating successfully in ATLAS physics at CERN	more internationally peer-reviewed requests for experimental beam time at the ISAC facility then it can possibly fulfill. In 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.	community as well as provide for the development of new rare and exotic ion beams, which are critical to maintaining the laboratory's position as a world leader in this science. This need is recognised in the five-year funding request remains because the allocation did not permit construction of the proposed second beamline and target development station. A Task Force is vigorously pursuing development of exotic beams from actinide targets. TRIUMF is also vigorously developing new beams with a resonant laser ion source and a so-called FEBIAD ion source. Development is initiated on tests with an Electron Cyclotron Resonance Ion source. Preliminary installation of the Charge State Booster to increase accelerated exotic masses has started. TRIUMF's Five-Year Plan funding request for the ATLAS Tier-1 Data Centre was denied. However, the Canadian university community, led by Simon Fraser University and the TRIUMF Director, were successful in obtaining CFI funding for the Centre along with matching funds from the Province of British Columbia. The Canadian physics community is now posed to take full advantage of Canada's contribution to the LHC at CERN.
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.	TRIUMF continues to meet twice a year with the Advisory Committee on TRIUMF (ACOT), twice a year with the Agency Committee on TRIUMF (ACT) and with the Experimental Evaluation Committees (EECs). The EECs for Materials and Molecular Science and Subatomic Science both meet twice a year and the EEC for Life Sciences meets once a year. All three committees consist of strong international memberships as well as strong Canadian representation. The TRIUMF Board of Management continues to meet three times a year, providing the TRIUMF Director with guidance on the management of the laboratory. The TRIUMF Operating Committee, consisting of representatives of the university community, users and TRIUMF staff meets monthly to advise the Director on scientific productivity and direction of the laboratory.

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	Progress Made in 2006-2007
		In addition to the committees that facilitate planning and coordination of the laboratory such as the ISAC Science Forum, TRIUMF has now established a Priorities Committee to ensure strategic goals are set. A Quality Assurance (QA) Committee to ensure TRIUMF's QA policies and procedures meet or exceed the requirements of the Canadian Nuclear Safety Commission has also been established.
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.	TRIUMF continues to distribute a bi-annual newsletter worldwide to all potential users. The ISAC Scientific Forum, along with the ISAC Experimental Facilities Forum continues to meet on alternate weeks to ensure that all personnel and users involved with the program remain fully informed. Minutes of both meetings are available on the TRIUMF website. The ISAC Beam Development Strategy Group continues to meet weekly. The ISAC Science Seminar program holds as many as 12 seminars a month on ISAC Science. TRIUMF has designed and implemented an Experimenters' data base which allows experimenters to manage their own experimental documents.

2004-2005 Peer Review of the NRC Steacie Institute for Molecular Sciences (NRC-SIMS)		
Recommendation	Management Response	Progress Made in 2006-2007
The Institute work at reducing fragmentation within NRC-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	Agreed. NRC-SIMS is fully committed to develop a process that will better enable the identification of multi/interdisciplinary projects around which stronger teams of researchers can be built, and resources can be focused to achieve important long-range scientific and technological impacts. This is central to our current planning process that will be completed by June 2005.	The Institute further elaborated its theme areas (molecular diagnostics; materials for environmental remediation and alternate energy; and platforms for quantum technologies) within its business plan developed in 2006-2007 that is aligned with the NRC strategy. Opportunities for inter-Institute collaboration were identified within the themes in order to further support participation in multi-Institute, large scale projects.

2004-2005 Peer Review of the NRC Steacie Institute for Molecular Sciences (NRC-SIMS)		
Recommendation	Management Response	Progress Made in 2006-2007
The Institute set up appropriate project structures and organizations so that multi- or inter-disciplinary research projects can take place.	Agreed. NRC-SIMS recognizes that implementation of interdisciplinary, cross-Institute projects will require the introduction of new organizational structures. The management team of the Institute was restructured as a first step, and various models that allow world-class competencies to be maintained while supporting a culture of large-scale interdisciplinary research projects are being explored. It is important that these new processes allow projects to be initiated and terminated based on clear, well understood criteria.	The project-based approach to resource allocation continued as designed in 2005-2006. The portfolio continued to develop. Low priority projects were terminated and resources were reallocated to higher priorities.
NRC-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	Agreed. NRC-SIMS recognizes that a shift of Institute culture is needed towards one in which researchers recognize and articulate both the scientific importance and the potential (or actual) impact of their work. NRC-SIMS will choose problems of national importance and establish the appropriate balance of fundamental science that must be understood and applied science that delivers a more easily measured impact. NRC-SIMS must build a communicative environment, in which research findings can be discussed, widely understood, and possibly transferred to other hands for exploitation in innovative ways. In addition, the NRC-SIMS business office will develop a strategic business plan in 2004-2005 that will incorporate best practices in IP management, strategic use of the Sussex Industry Partnership Facility and more effectively engage NRC-IRAP.	The assessment of the IP portfolio was completed. Decisions were taken to drop patents with little likelihood of licensing. A new process to assess disclosures, with the intention of taking higher quality initial decisions about patent protection, was implemented.
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 NRC-SIMS with an emphasis on external matching funds.	Agreed. NRC-SIMS is committed to meet the challenge of acquiring more external funding and introducing a competitive element for internal resource allocation, while ensuring that funds are channeled strategically. Institute level staff will be proactive in identifying and communicating external funding opportunities and deadlines to staff and providing administrative/logistical support so the researchers are not unnecessarily burdened with the logistics of grant writing. There is a need for management	The process of reallocation of 15% of operating funds was implemented. A formal risk assessment of projects was introduced. Project decisions were taken in relation to the balance of risk and impact. Resources were allocated according to these priorities.

2004-2005 Peer Review of the NRC Steacie Institute for Molecular Sciences (NRC-SIMS)		
Recommendation	Management Response	Progress Made in 2006-2007
	to accommodate the time-scales of maintaining Institute core competencies at the cutting edge, responding to technology opportunities in partnership with emerging industries, or undertaking discovery-oriented programs whose impact horizon may be ill-defined at the outset. To accomplish this, NRC-SIMS management intends to introduce a strong element of project based resource and performance management in FY2005-2006.	
The Institute develop procedures for internal scientific control which combine strong elements of internal and external competition.	Agreed. With the shift towards project-based management, NRC-SIMS will introduce a range of project control, evaluation and reporting elements. Projects will need to be described and justified in competition for resources. Evaluation of progress will be made to justify continuation of resources and projects will be managed against deliverables within fixed time frames. The project management process is viewed as a framework to enable the other recommendations of the Peer Review committee to be addressed, namely: (1) identification of multidisciplinary projects and building of cross-Institute/NRC teams (2) communication of project goals, progress and achievements among staff, laying the groundwork for knowledge transfer and further impacts (3) building a culture of teamwork in securing funding from various sources, both from Institute-level internal allocations and with external partners. NRC-SIMS management recognizes that leading interdisciplinary research can only be carried out by teams that are able to maintain depth in their disciplines. An appropriate balance between discipline-based projects and interdisciplinary projects must be maintained. Excellence will be evaluated by periodic external peer review of groups and projects. NRC-SIMS management will work to convince researchers that well managed research projects are not inconsistent with excellent fundamental research.	Projects were evaluated, in part, on the ability to leverage the resources with external competitive (peer reviewed) funding. A greater portion of the Institute's budget allocation was used to match contributions from partners and other funding sources.

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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.	The request seeking funding renewal for the Life Sciences, e-Business/Information Technology and Ocean Technologies Initiatives is being developed. In moving forward with the Cape Breton initiative, the NRC Institute for Information Technology will reassess the Wireless Systems Initiative and continue to adjust both the positioning and the value formula accordingly.	*Completed.* Renewed funding received for Life Sciences, e-Business/Information Technology and Ocean Technologies Initiatives in 2005-2006. The Wireless Systems initiative in Cape Breton did not receive funding beyond 2004-2005 in its existing configuration.
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).	Participation of industry in cluster activity is vital to cluster progress, and it is a necessary progression to seek increased involvement of industry in the clusters. Industry participation will be sought through several mechanisms such as workshops, technology demonstrations, conferences on emerging technology opportunities, the creation of interest groups in specific areas and training initiatives on platform technologies.	Life Sciences: In filling Atlantic Initiative research positions within the Life Sciences initiative NRC-IMB has undertaken an unprecedented level of industrial consultations. Five job descriptions were developed based on the comments of industrial partners - these descriptions were then sent out to those partners to agree on top three which are currently being filled. In addition, NRC-IMB, working with the industry association and a

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		provincial partner, Nova Scotia Business Inc., has enabled several local companies to jointly participate in BIO, the premier biotech industry conference in the world. For three days the industrial partners and government agencies shared space in the Atlantic Pavilion and represented the region as the place to do biotech business. The roadmapping exercise has moved to a higher level with local industry and community leaders taking ownership of the process. An asset map has already been completed with industry involvement and input. Further support is provided to the industry association to ensure the success of BioPort Atlantic, an annual event attracting industrial members of the regional life sciences and business communities. 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 involved has increased and include: Innovation Team New Brunswick; University of New Brunswick Research Network; Knowledge Industry Task Force; Community of Innovation (Fredericton); Service New Brunswick); New Brunswick Business Council; Host of NBIF Venture Capital learning events; Host of annual Cybersocial, participate in Atlantic Angel Network meetings; membership on Acadian University School of Computer Science Industrial Advisory Board; membership on review committees for Atlantic Canada Opportunities Agency project review committees; host of 8th International Conference on Electronic Commerce (ICEC'06). Ocean Technology: NRC-IOT and NRC-IRAP have continued their involvement with the Campus Incubator Consortium through an NRC-IRAP management contribution agreement with the PJ Gardiner Institute to support the incubatees at the Ocean Technology Enterprise Centre (OTEC). The goal of this collaboration is to promote and assist the development of innovative ocean

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		technology firms in the St. John's region, identify firms ready to enter the OTEC Young Entrepreneurs Program and administer the shares (funding) to the companies under their OTEC Young Entrepreneurs Program. The Young Entrepreneurs Program (YEP) is directed at new graduates of engineering, science or technology programs who are starting or contemplating starting new ocean technology enterprises. The purpose of YEP is to remove many of the obstacles to success that face new start-up companies. A current OTEC company cites the initiative as "a very useful program that is also very cash efficient. It is useful because it is a seed funding mechanism aimed at young entrepreneurs – enabling them to take the decision to try to start their own enterprises rather than pursue other opportunities. I know several of the students who have availed of this program … most of them were otherwise bound for the Gulf of Mexico oil industry. I think part of the success of the program is that the money involved is rather modest – but enough to enable the key decision by motivated people as a very special time in their lives."
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.	It is crucial to have strong linkages and relationships between IPFs and host Institutes to ensure strategic objectives are optimally met. The IPF will play a key role as the clusters mature and commercialization activities increase. If the coordination function noted in Recommendation 7 below, is implemented, exchange of best practices on IPFs and cluster development will be part of coordination activities.	Life Sciences: A major challenge in positioning the NRC-IMB industry partnership facility (IPF) in the context of provincial incubation facilities owned by Innovacorp has been addressed through establishment of a "Synergy! Initiative" between the two organizations. The NRC IPF is positioned in a supportive role for technology-based activity (supporting relationships between companies and NRC scientists), while Innovacorp functions as a basic landlord. Final completion of IPF laboratory space fit-up has created an additional 278 m^2 available for industrial partners. In addition: • Programming outlined last year has begun (program to fund collaborative and contract research between industrial partners and NRC-IMB researchers; program to bring industrial partners to the Institute as speakers; and a series of bilateral meetings to learn about industry needs

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		and to familiarize the industry with our research capacities). • A relationship with MedMira, the sole public Biotech company in region, has been established through an AI-resourced cancer biomarkers project. As the project progresses MedMira expects to become an IPF client. • A Zebrafish facility fit-up has been completed and a community- initiated project to rationalize regional expertise in drug screening using zebrafish promises to deliver a world-class centre. 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. Ten tenants kept the IPF at full capacity, of which 8 were incubator companies, 1 was a research collaborator (Populomix Cancer Research Institute) and 1 was Industry Canada (International Trade). An IPF tenant, Virtual Expert Clinics won the 2006 KIRA Award for Most Promising Start-up. Ocean Technology: The "Cluster Partnership Facility" (CPF) uses screening criteria to ensure that applicants contributed to the Ocean Technology cluster prior to being accepted in the IPF. Below are highlights of some of the IPF activities: • Ten Formal Collaborative Agreements (FCAs) were signed/amended during the year with cluster partners. This represents $1.2 million from the cluster initiative during this fiscal year. • Ten occupants in the Industry Partnership Facility which is now 100% occupied (2 in Young Entrepreneurs and 8 co-locating). The NRC-IOT strategic planning efforts that began in summer 2006 are addressing cluster efforts, measures, linkages.

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		NRC-IRAP ITAs work directly with OTEC clients on specific funded and non-funded projects. Co-location facilitates interactions and enables quick response and mentorship by NRC-IRAP.
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 Atlantic Initiatives Management Self-Assessment is a diagnostic tool that has been developed to assist institutes, NRC-IRAP and NRC-CISTI identify areas for improvement to support technology clusters in their communities. The Self-Assessment addresses Monitoring and Management. The outcome of the self assessment process will be an action plan developed by institutes, NRC-IRAP and NRC-CISTI to address areas for improvement and respond to the evaluation recommendations. As the institutes engage in phase two of cluster development, institutes will ensure that baseline information about the cluster and the Institute is collected providing a basis for future comparison. Baseline information about the cluster should be collected by cluster members at the community level.	Ocean Technology*: A* Report commissioned by OceansAdvance and Industry Canada (*"A Good Investment – Public Sector Financial Support for Growing the Ocean Technology Sector in NL")* had the following findings: "the Ocean Technology industry in Newfoundland and Labrador is one of the fastest growing components of the Provincial economy and is considered to be a leader within Canada. Globally, many Newfoundland and Labrador companies are becoming well known for their innovative technology and have established strong niche markets" - 52 active companies in the province – all are in the St. John's region; - 11 public sector organizations and institutions fostering growth, with activity level approximately $35 million In the past 5 years: - sixteen new companies have been formed - employment in the Ocean Technology industry increased by more than 65% to a total workforce of 1470 - total revenues in companies in the industry almost doubled to nearly $230 million
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 Self Assessment addresses Strategy, Planning and Governance (business/action planning). The NRC Action Plans will be developed when new funding is secured and allocated to the Atlantic Initiatives and presented to SEC. The NRC Action Plan will specify objectives, activities, time lines and performance measures for the scope of NRC's involvement in the development of the cluster.	Life Sciences: With the Roadmapping effort viewed as an ongoing endeavour within the community (no commitment to early completion from the community), we have expanded the use of internally-developed business planning and performance management tools to ensure maximum impact of AI on cluster growth: • NRC-IMB AI hiring priorities were established through a formal community engagement process that focussed on industry involvement. • A formal AI project map has been established to ensure maximum alignment with community needs. • Cluster-specific progress indicators have been established,

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		gathered and compiled in the form of an Asset Map A parallel effort is underway to establish the progress indicators for NRC's contribution to the cluster. A working action plan linking finance and programming has been created to ensure a balance between accountability and mandate delivery. E-Business and Information Technologies: As per Business Case and Operational Case Planning: the staffing plan (ramp up) was largely completed by March 2007; core support functions (networking, communications, administration) were centralized; research groups and research projects were realigned and focused; the Research Plan was implemented. Under the Research Plan: research has been focused to create critical mass through two Strategic Initiatives, two Priority Projects and a few major projects; strategic research collaborations have been formed with SMEs on core projects; SMEs and universities have leverged funding for research through partnerships with NRC-IIT; 21 students were hired during the fiscal to support research and HQP goals. NRC-IIT developed a draft Strategic Plan in 2006, but will be converting this to a Business Plan in 2007 to be in concordance with the NRC Renewal Business Plan now required of all Institutes. NRC-IIT undertook an RMSA and implemented actions from this (see below Accountability Requirements RMAF). Ocean Technology: Action plans for the Newfoundland and Labrador Ocean Technology Cluster were completed in 2005. Ongoing accomplishments include: ▫ NRC-IRAP continues to be seen as a key integrator for collaboration among industry and the public sector performers of research leading to the successful commercialization of cluster-based SME technologies. ▫ In coordination with NRC-CISTI, NRC-IRAP continues to develop CTI services in order to ensure the best in class strategic advice to cluster participants and the optimization of NRC-IRAP's investments. ▫ NRC-IRAP plays a key role in promoting locally, nationally,

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		and internationally the clusters in the Atlantic & Nunavut region for the purpose of attracting regional growth opportunities. ▫ NRC-IRAP has several funded projects with clients in the Ocean Technology sector. ▫ Through the Network Member Contribution Agreement file, NRC-IRAP supports cluster and SME growth, directly and indirectly: with OceansAdvance, PJGardiner Institute and Fisheries and Marine Institute of Memorial University. ▫ NRC-IRAP is working to develop new international linkages with similar clusters; in 2006 the focus was on Israel in collaboration with Canada-Israel Industrial Research and Development Foundation and the Province of Newfoundland and Labrador. ▫ The "Cluster Partnership Facility" (CPF) is 100% occupied.
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.	NRC institutes cannot on their own, develop a cluster plan. Institutes can, however, facilitate, encourage, and advocate for the development of a strategy for each cluster. The development of a strategy for the cluster is a logical next step as institutes enter phase two of cluster development.	<u>Life Sciences</u>: • Completed Asset Map has been validated and is scheduled for release in the spring of 2007. • The development of a roadmap continues • The level of engagement has been escalated to community leaders. NRC-IMB DG is actively involved in the process. • There appears to be a mandate for BioNova, the industry association, to be the community leader, with a Board of Advisors (separate from the Bionova BOD) governing its involvement. NRC-IMB is a major facilitator of this process. • An environmental scan has been conducted through AI resources providing the industry association with an overview of current provincial biotech activity, outlining the industry trends, and providing recommendations on the development of support in the provincial sectors. <u>E-Business and Information Technologies</u>: NRC-IIT continues its role and support of community members. Our role with Innovation Fredericton continued. The institute also works closely as a partner or collaborator with the cluster research agendas of: the Universities of New Brunswick and Moncton; provincial government departments (e.g., SNB, Public Safety); other significant research organizations

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		(such as: the Atlantic Canada Research Institute, Cancer Populomix Institute, the Centre Internationale de Development de l'inforoute en Francais). With these, NRC-IIT is included in their cluster research plans. Ocean Technology: NRC-IOT, NRC-IRAP and NRC-CISTI continued to play a role in the facilitation and fostering the development of the cluster. NRC staff are integral to ongoing cluster activities, promotion and growth, including identifying other government department resources and international connectivity as required; NRC provides space at NRC-IOT for events/ activities as well as funding when appropriate. The Ocean Technology cluster in Newfoundland and Labrador has an independent cluster initiative agency, OceansAdvance, which promotes the growth and development of the ocean technology sector.
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.	This would be a logical next step in cluster development. NRC will look at the possibility of creating a coordinating function as part of the next phase of Technology Clusters Initiatives in Atlantic Canada.	*Completed.* In 2005-2006, NRC established a National Technology Cluster Secretariat (TCS) 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. There has been a change in the reporting structure of TCS: The Technology Cluster Secretariat reports to the Director General, Strategy and Development Branch through the Director of the Planning and Performance Management Director. In March 2007, the Technology Cluster Secretariat convened the first meeting of its Cluster Initiative Network. This pan-NRC network of internal cluster practitioners meets two to three times per year to discuss common projects, goals, challenges, best practices and lessons learned.
The NRC Action Plan for each cluster should detail the role and contribution of communications in supporting the cluster initiative.	The Self Assessment addresses Communications and Stakeholder Relations. The NRC Action Plan for each cluster (Recommendation 5 above) will detail the role and contribution of communications in supporting the cluster	Life Sciences: A Cluster Administrative Assistant has been hired and has assumed some of the coordination and liaison roles, including liaising between NRC-IMB communications and the communications department of the industry association, which has the mandate to be

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	initiative.	the community leader. NRC Cluster personnel have worked closely with the industry association to develop common cluster communication/marketing tools for events such as BIO. The industry association has conducted an audit of the NRC-IMB communications strategy for fit with Cluster goals to ensure alignment with community vision and strategies. Ocean Technology: An explicit communication plan for NRC-IOT does not exist, rather cluster communications (benefits and strategies) are effectively communicated by OceansAdvance through extensive series of consultations with government officials at all levels, as well as others within the industry.
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.	When the funding levels of the renewed AI are in place and the plans for each initiative developed, an updated Results-based Management and Accountability Framework (RMAF) will be implemented and accountability will be tracked, reviewed and strengthened accordingly. The updated RMAF will be a cooperative effort of the AI Directors General and will be led by Corporate Services or a cluster coordinating function, if implemented. When the funding levels of the renewed AI are in place, institutes, NRC-IRAP and NRC-CISTI will track their AI funding separately so that cluster activity is accounted for and to demonstrate progress against the objectives outlined in the NRC Action Plan.	Life Sciences: All resources provided through AI, including human and financial resources, have now been identified within the Institute. All AI expenditures are tracked through a transparent system of internal orders allocated against a dedicated cost centre. Decision making process for resource allocation is transparent, with a budget-linked action plan created each year. Decision criteria have been identified and are being utilized to make sure that both the mandate of AI and accountability requirements are met. Specific measures have been implemented in the project selection process to ensure that needs of the community are being targeted. A framework for evaluating both the progress of the cluster and NRC's contribution to the progress is being built, with large components already in place. E-Business and Information Technologies: NRC-IIT's performance and accountability framework continues to be measured using NRC's Research Management Accountability Framework. Within this, three priorities were selected for 2006-2010: Program/Project Management; High Quality People; and Technology Transfer and Commercialization. In addition, cluster success is 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

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		a Project Template approval process. Research continues to be focussed through two Strategic Initiatives and two Priority Projects. Also, the institute has also entered into three new research collaborations, two with companies and one with a research institute, all of which are partly funded by ACOA. 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. NRC-IRAP uses separate fund centres for all AI grants and contributions and operations funds; further, results/success stories are separately tracked and reported.
Resource allocation should be based on a regular collective challenge process. In some cases, tracking of AI funding has been inadequate and must be improved.	NRC will continue to hold regular internal challenge meetings as it did this year.	Life Sciences: Resources are allocated based on continually re-evaluated alignment with community needs, NRC priorities, NRC-IMB priorities, and AI mandate, as outlined above.
AI funding should be tracked separately from A-base funding.	AI funding will be tracked separately from A-base funding as described in response to Recommendation 9, above.	Life Sciences: Addressed above. E-Business and Information Technologies: All three sections of NRC-IIT (Ottawa, Gatineau and New Brunswick) are tracking expenditures separately. Separate fund 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. Ocean Technology: Addressed above.

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NRC should continue to fund the Genomics and Health Initiative and seek renewal of the Genomics R&D Initiative for a fourth phase.	Discussions to address the Phase IV program and competition design will be initiated with the GHI Directors General Committee and in consultation with the GHI Program Coordination Committee. Recommendations from the GHI Evaluation and lessons learned from GHI-3 will be incorporated into the Phase IV program design.	The GHI Phase 4 (GHI-4) program framework and competition design was assembled in consultation with the GHI Directors General Committee and the Program Coordination Committee. Recommendations from the GHI Evaluation and lessons learned from GHI-3 were incorporated into the GHI-4 framework. A call for GHI-4 proposals was issued in mid-December 2006 and a competitive peer-reviewed evaluation and selection process is underway. Program funding decisions (2008-2011) will be made by NRC Executives the fall of 2007 so that new GHI-4 research programs can start in April 2008. Efforts are underway to renew the Genomics R&D Initiative through an interdepartmental Working Group (WG), chaired by NRC.
NRC should ensure that, once strategic priorities are articulated through the Renewal Initiative, GHI's objectives clearly align with these.	GHI's objectives will be reviewed after the NRC strategic priorities have been articulated through the Renewal Initiative. Revisions will be made to ensure that the objectives are clearly aligned with NRC strategic priorities. The VP (Life Sciences) will develop the revised objectives in consultation with the GHI Directors General Committee.	*Completed.* GHI objectives have been reviewed and revised to ensure alignment with the new NRC Strategy (2006-2011). GHI-4 objectives were approved by the VP Life Sciences in December 2006. The revised objectives are: ▪ To translate scientific and technical knowledge within genome sciences and health-related research into social and economic well being for Canada. ▪ To create and use new genomics or health-related technologies to contribute to the global competitiveness of Canadian industry in key industrial sectors (e.g., pharmaceuticals, biotechnology and agriculture). ▪ To foster the development of large scale multi-institute and multi-partner research teams necessary to undertake multi-disciplinary research demanded by genomics, proteomics and health-related research. ▪ To support and participate in regional, national and international genomics and health-related innovation networks through cooperation and integration across NRC institutes and with external partners such as industry, academia, government departments and other research organizations.

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		To foster excellence in horizontal research program management and accountability.
A portfolio approach should be taken in future GHI phases, funding a balance of new basic research Programs and Programs that are more applied. For those Programs that propose "closer to market" applications, a market assessment study should be performed as part of the proposal process to examine the potential impacts of the work.	In GHI Phase IV, a more formalized portfolio approach will be established as part of the program evaluation criteria for use by the GHI Expert Panel, and as a guide for NRC Senior Executives when making program funding decisions. The portfolio approach will be based on funding a balance of programs with shorter-term commercial potential as well as those with longer-term research objectives. Lessons learned from the market analysis studies conducted by NRC institutes (e.g., BRI) and as part of the pilot study conducted by NRC Corporate Services, will be used to develop the specific requirements for market analysis studies that will be implemented into the GHI Phase IV evaluation criteria. The GHI Expert Panel will also be strengthened to include additional members with business and marketing expertise.	As part of the GHI-4 program funding decision framework, NRC Senior Executives will use a formal portfolio approach in the selection of program proposals to establish a balanced portfolio of programs with shorter-term commercial potential as well as those with longer-term research objectives. The proposal evaluation process has been strengthened in GHI-4 through the implementation of the requirement for each proposal to undergo independent market/strategic positioning studies. The GHI-4 Expert Panel has been established and new members have been added with business and marketing expertise.
Efforts should continue to build upon the progress made in GHI-2 in integrating activities across NRC. In addition, the complementarity between GHI Programs and other genomics and health research across Canada should be strengthened through increased collaboration with organizations external to NRC.	Integration and leverage were important elements in the GHI-3 proposal evaluation criteria. Proponents were encouraged to assemble integrated, multi-disciplinary research programs that involved more than one NRC institute, and to include research coordination and collaboration with other government departments and agencies, academia and/or industry. An inter-departmental Genomics R&D Coordinating Committee oversees the collective management and coordination of the federal Genomics R&D initiative, and ensures that collaborations between federal departments are pursued wherever relevant and possible. The requirement for inter-institute collaboration in GHI Phase IV research programs will be strongly encouraged and collaboration with organizations external to NRC will continue to be an important criterion in proposal	The requirement for inter-institute collaboration and collaboration with organizations external to NRC, has been identified as a key evaluation criterion in the GHI-4 program framework. There is good evidence in the GHI-4 Letters of Intent approved for full proposal development that this requirement is being addressed. The interdepartmental Genomics R&D Working Group (that supports the ADM Coordinating Committee) meets regularly and shares information related to departmental research program selection processes to ensure that collaborations between federal departments are identified and pursued. An example is the collaborative efforts at NRC and Agriculture and Agri-Food Canada related to *Brassica* (Canola) seed development. As part of the Genomics R&D Initiative renewal, the Working Group is actively engaged with Genome Canada and both groups are working

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	evaluation.	collaboratively to determine strategic priorities in genomics R&D.
A GHI specific Logic Model, which defines expected results in the near, medium and long term, should be established to facilitate more effective performance measurement. Objectives must be clearly stated and performance should be reported against the stated objectives at both the Initiative and individual Program level. Meaningful indicators that are linked to clear objectives or strategic plans need to be identified, agreed to (i.e., between management, researchers, VPs, etc.), tracked and accurately reported upon. The need to track performance and the allocation of resources should be balanced against the associated administrative burden.	NRC is currently leading an evaluation of the interdepartmental Genomics R&D Initiative. As part of this evaluation, a revised Results-based Management and Accountability Framework (RMAF) will be prepared for the Genomics R&D Initiative. The consultant used to revise the RMAF will be used to develop a GHI specific Logic Model, which will define expected results in the near, medium and long term. Steps have already been taken in GHI-3 Program Charters to better define program objectives and key deliverables/milestones and research programs are required to submit quarterly reports that are focused on progress reporting against research objectives and milestones. In GHI Phase IV Program Charters there will be a focus on improving the definition of research objectives and how they link to the Initiative strategic plan, and on better articulating and linking key program milestones.	The evaluation of the interdepartmental Genomics R&D Initiative has been completed and as part of the evaluation contract, a revised Results-based Management and Accountability Framework (RMAF) has been prepared for the Initiative. Discussions are underway with the NRC Strategy and Development Branch (Planning and Performance Management Directorate) to determine if this RMAF and associated Logic Model can be used by GHI or if a separate, GHI specific logic model is required. A key requirement in GHI-3 quarterly reports has been the reporting of research against research objectives and milestones. Efforts have been taken to ensure that administrative support is provided by the GHI Coordination Office to minimize the burden associated with resource tracking. The GHI-4 program framework has identified the requirement for Program Charters to provide more clearly defined research objectives and their linkages to strategic priorities. There is also a requirement for GHI-4 Charters to develop key program milestones that can be used to track progress.
Efforts should be made to clarify the roles and responsibilities of the business development function and communicate it to researchers and business development officers so there is a common understanding of what activities are part of the function.	NRC is launching a comprehensive review of NRC business activities to ensure we have the right business activities and the right support for these activities in the future. Specifically, the Terms of Reference for this Review call for examining activities with a view to revamping support to achieve the goals under our Renewal Plan, to capitalize on opportunities under Portfolio management; and to work better 'horizontally'. This Review will ensure that GHI issues and opportunities uncovered during the evaluation are addressed appropriately. This would include clarifying business development and marketing roles and communicating them across the Program and the Council.	The need to clarify roles and responsibilities for 'business activities' was one of the recommendations of the Business Review project. This finding was consistent and was derived from interviews of BDO staff, from corporate staff and from Research Directors. Subsequently, it became one of the priorities for action this FY in the activities of the new central Business Support group. Specifically, a new Business Support project has been approved which looks at streamlining business practices at NRC. The initial task of this project addresses the need to clarify roles, responsibilities and authorities around agreement consideration and negotiation. Other areas of clarification will follow.

2005-2006 Evaluation of NRC's Genomics and Health Initiative		
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In the context of the upcoming Genomics R&D Initiative evaluation, an in-depth review of the science directions and research thrusts of departments involved in Genomics R&D as well as other federal organizations including CIHR, Genome Canada, the Canada Foundation for Innovation, and the Canadian Biotechnology Strategy should be undertaken to determine the extent to which the different programs are complementary or duplicative. In this regard, the status and/or results of the current review by the Minister of Industry of federal government's involvement and investments in genomics R&D need to be taken into consideration.	The evaluation of the interdepartmental Genomics R&D Initiative will provide an in-depth review of the science directions and research thrusts of federal departments involved in Genomics R&D. A similar review (i.e., the Genomics Review) of other federal organizations including the Canadian Institutes of Health Research, Genome Canada, the Canada Foundation for Innovation, and the broader Canadian Biotechnology Strategy has been initiated and is being led by Industry Canada. These evaluations/reviews will provide an excellent examination of how these different programs could be more effective. The GHI Coordination Office, in consultation with the GHI Directors General Committee, will take steps to address any specific issues or concerns that are raised in the recommendations and associated management responses of these evaluations/reviews.	*Completed.* An evaluation of the Genomics R&D Initiative was conducted in 2006. The primary conclusion from this evaluation was that the Genomics R&D Initiative is relevant as a critical element of the broader Canadian activities in biotechnology and that it is complementary to other initiatives related to the regulatory activities associated with biotechnology and other federal genomics R&D investments (e.g., Genome Canada). Industry Canada has recently completed a review of a full range of federal government involvement and investments in genomics research, including Genome Canada, the granting councils (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, and Social Sciences and Humanities Research Council of Canada), Canada Foundation for Innovation, Canada Research Chairs, the Networks of Centres of Excellence, and the intramural Genomics R&D Initiative. This review concluded that the roles of these federally-funded research organizations are complementary and integrated, as well as appropriate to provide the capacities and structures needed to support the mandate of departments and the different scales of research programs. Furthermore, while noting that there is room for improvement in the area of coordination and strategic planning, it concluded that federal investments have well positioned Canada given genome science developments, the increasing magnitude of collaborations, and the continuing investments by foreign governments and institutions in genomics R&D.
The GHI Coordination Office should continue to help support the Scientific Leaders in the area of project management (e.g., training, reference materials, information sessions, workshops) with special attention given to those with less experience. The Coordination Office should help to facilitate the sharing of good management practices between experienced Program	One of the key roles of the GHI Program Coordination Committee is to share best management practices amongst Scientific Leaders. This approach will be strengthened in GHI Phase IV by the introduction of a project management workshop to be held during the launch of GHI-4. The GHI Coordination Office, in consultation with participating institutes and Corporate Services, will develop the workshop. The workshop objective will be to provide guidance on GHI and Institute program management requirements and performance management, and will include presentations on best practice from experienced GHI scientific leaders.	The GHI-4 program framework has identified plans for a project management workshop to be held during the launch of GHI-4 in 2008. The workshop will be aimed at providing guidance on GHI and institute program management requirements and performance management, and will include presentations on best practice from experienced GHI scientific leaders as well as presentations from professional project managers in the private sector.

2005-2006 Evaluation of NRC's Genomics and Health Initiative		
Recommendation	Management Response	Progress Made in 2006-2007
Drivers/Scientific Leaders and new ones.	Consideration will also be given to including presentations from professional project managers in the private sector. With respect to specific project management training for Scientific Leaders, the GHI Coordination Office can provide financial support and facilitate specific training to support the delivery of horizontal research programs. However, the training and development of Scientific Leader staff is an institute responsibility and any efforts in this area would require coordination and approval from institute management.	
Implementation of the new governance and accountability structure put in place for GHI-3 should be monitored as to its effectiveness as Phase 3 progresses.	The GHI Directors General (DG) Committee as well as the GHI Coordination Committee will monitor the effectiveness of the new GHI Governance and Accountability structure. This will be an annual agenda item for both committees, and recommendations made by the committees will be used to guide governance model revisions. The effectiveness of the structure and operation of the various committees will be a key issue for discussion. Any major changes to the governance and accountability framework would need to be agreed to by the GHI DG Committee and submitted to SEC for formal approval.	The requirement has been discussed with the VP Life Sciences (as Chair of the GHI Directors General Committee) and it has been agreed that the GHI governance framework will be reviewed in fiscal 2007-08 so that a revised framework can be approved at the beginning of GHI-4 (April 2008).
Proposals for future phases should be streamlined, and should focus on the articulation of clear and realistic objectives and milestones. There should be more transparency in the final Program selection process, including better articulation and communication to the Scientific Leaders of the rationale used for final funding decisions. Consideration should be given to tracking the time taken to develop proposals for any future phases.	Changes to streamline and focus proposals on the articulation of real objectives and milestones have been initiated in GHI-3 and this will be built upon in GHI Phase IV. Efforts to improve the transparency of the final program selection process were also introduced in GHI-3 and additional steps will be taken in GHI Phase IV. For example, a more formalized proposal evaluation system will be developed to provide specific feedback on each evaluation criterion. This information will then be used to create evaluation summary documents that will be communicated to each proposal proponent. The overall objective of this change will be to better articulate the rationale used in the decision making process.	The GHI-4 program framework has introduced changes to streamline and focus proposals on the articulation of real objectives and milestones. Changes to improve the transparency of the final program selection process have been established in GHI-4 and a more formalized proposal evaluation system is being used. This system is based on providing proponents with much more detailed (and specific) feedback on each evaluation criterion in terms of the areas that were seen as strengths and weaknesses, together with commentary that provides the reasoning for any proposed changes. This approach has already been implemented as part of the GHI-4 Letters of Intent evaluation process.

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Recommendation	Management Response	Progress Made in 2006-2007
The Programs' Charters need to include specific plans on how the project will end in the event funding is discontinued after three years.	Based on evidence presented in the evaluation, there is clearly a perception by some participants in GHI research programs that funding is likely to continue beyond the nominal three-years of program approval. In GHI-2 and GHI-3, competition guidelines indicated that programs were to be planned and funded for a limited duration (typically three years), and that associated research objectives and milestones were to be prepared on this basis. In GHI Phase IV, program duration and the process for funding renewal will be more explicitly presented in program documentation. Additionally, as part of the GHI Phase IV Program Charter development, a new requirement will be introduced that will require each program to prepare a closure strategy in the event that funding is discontinued. As part of the GHI-3 program closure strategy, proposals may be put forward to seek continuing funding for a short period to ensure the completion of critical work. Efforts will be undertaken for Phase IV funding decisions to be made six months in advance of GHI-3 completion so that adequate time is provided to implement closure strategy plans.	In the GHI-4 program framework and in related presentations on the GHI mode of operation, program duration and the process for funding renewal have been explicitly presented. A new requirement has been introduced as part of the GHI-4 Program Charter development that requires each program to prepare a closure strategy in the event that funding is discontinued. GHI-4 funding decisions will be made in mid-November to provide 4.5 months advance notice so that GHI-3 programs not continuing into Phase 4 have adequate time to implement closure strategy plans.
To make optimum use of external reviewers, an independent assessment of past performance by experts should be integrated into the Program selection process of any new GHI phases. Peer reviewers should be asked not only to review proposed work, but also provide an opinion on past performance at the same time. Specific questions relating to research completed in the previous phase (e.g., achievement of objectives, quality and relevance of the outputs/outcomes) should be included as part of the proposal review.	GHI program proposals are required to include a Background Section that provides progress to date in areas directly related to the proposal, and a list of outputs (e.g., publications, patents, licensing agreements, etc.) related to the research. For existing GHI programs, peer reviewers and members of the GHI Expert Panel have used this section to assess past performance. In the GHI Phase IV Competition, this section of the proposal template will be strengthened and the requirement to explicitly report on progress towards research objectives and milestones in areas directly related to the proposal will be made a requirement. Additionally, the GHI-3 performance reports will be made available to the reviewers of GHI-4 proposals. GHI-3 research programs are required to submit quarterly	The GHI-4 full proposal template has been strengthened to include a requirement to explicitly report on progress towards research objectives and milestones in areas directly related to the proposal. Additionally, the GHI-3 performance reports will be made available to the reviewers of GHI-4 proposals. The GHI Expert Panel conducted a formal mid-term review of GHI research programs in December 2006, and recommendations were made to the Vice President Life Sciences. While funding for each program was continued, recommendations from the Panel resulted in changes to research objectives and direction as programs plans were established for the final year of GHI-3 (2007-2008).

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Recommendation	Management Response	Progress Made in 2006-2007
	performance reports that are reviewed by program Steering Committees and by the GHI Directors General Committee. As well, it is planned for the GHI Expert Panel to conduct formal mid-term reviews of GHI research programs, with recommendations made to the Vice President Life Sciences, who will determine if funding for a program will be continued, reduced or reallocated. These existing performance evaluation mechanisms are considered comprehensive, and the integration of additional, independent assessments of past performance as part of future GHI program selection processes are seen to be unnecessary.	
Before replicating the GHI model for other NRC horizontal initiatives, the following issues need to be taken into consideration: ▪ The effectiveness of a GHI-3 type governance framework; ▪ The matching funds approach and the effect it has on institutes' ability to participate in multiple horizontal initiatives; ▪ The balancing of the competitive process and accountability requirements with the demands on NRC scientists to prepare proposals at the institute and horizontal levels and the ability to find external experts to participate in reviews; and ▪ The establishment of a suitable funding cycle in which the desired impacts are achievable.	NRC Senior Executive agree to take these issues into consideration before putting in place any future horizontal initiatives at NRC.	The issues related to governance and funding for horizontal initiatives are currently being examined by NRC. A meeting of the Leads of Sector Plans is planned to take place in June 2007 to identify solutions to these questions.

2006-2007 Evaluation of Central and Western Cluster Initiatives - Institute for Fuel Cell Innovation		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
NRC-IFCI must articulate a value proposition to industry to ensure its research and development (R&D) complements industry rather than potentially placing itself in competition with industry.	*Accepted.* We will regularly review, with our partners, our research directions against short, medium, and long term needs of the fuel cell cluster, and make adjustments in order to ensure that we maximize our impact in meeting the needs of industry through the unique provision of technology breakthroughs and expertise, and core-competencies. Our Cluster Business Plan is based on industry consultations, an independent survey of their needs, and the Round Table, and as such has captured key parts of their recommendations: ▪ We will communicate our cluster plan to the cluster members, advisory board and other stakeholders, including NRC-IFCI staff. ▪ The cluster funding will be dedicated to working with industry to meet the short and medium term needs. We will also use a small portion of the funding to collaborate with universities to address next generation technologies that will enable the industry to sustain its global leadership. ▪ We will use our A-base funds to develop relevant core competencies that will allow us to become world leaders enabling us to meet industry needs, and will dedicate a small portion to exploratory work. ▪ We will link the cluster with universities and global research networks to bring in expertise and knowledge.	• Set up a technical sub-committee within the Advisory Board that included 8 experts in PEM (Proton exchange membrane fuel cells) technology • Cluster and business plan implemented to reflect the alignment with industry needs • Establishing PEM national network to marshal R&D resources across Canada and link with industry • Established NRC-MOST (Ministry of Science and Technology of the People's Republic of China) joint research project to support the Fuel Cell cluster China strategy. • The cluster plan was presented via a PowerPoint presentation to the Institute for Fuel Cell Innovation Advisory Board, to the general cluster members and to staff. • To meet industry short and medium term needs we began our first consortium and did a preliminary project on contamination, leading to a full project with Ballard & Hydrogenics in 2007-2008. • Links with University of Victoria, University of Waterloo, University of Alberta, and University of Calgary were strengthened through joint projects and Memorandum of Understandings.
NRC-IFCI should focus on ways to increase usage of the HTEC, including the implementation of targeted marketing efforts.	*Accepted.* ▪ NRC-IFCI will continue to implement the marketing plan for the HTEC. We will allocate 20% of the time of the Business Development Officer (BDO) as well as 40% of Technical Officer (TO) time towards developing projects	• There is an increase in utilization of this area over the last two years. Funds have been used to advertise and market the facility. • Cluster companies such as Ballard and Azure are starting to utilize the chamber on an on-going basis. • Hired a co-op student for HTEC marketing. • Talks with Powertech and CTC are ongoing.

2006-2007 Evaluation of Central and Western Cluster Initiatives - Institute for Fuel Cell Innovation		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
	for HTEC. ▪ We will continue to work with H2FCC to increase utilization of HTEC by the BC fuel cell cluster. ▪ We will establish a partnership with Powertech Labs and CTC to market the HTEC to other industry sectors such as oil and gas, mining and military.	
NRC-IFCI must continue to focus on building internal research capabilities.	*Accepted.* Building core competencies and research leadership skills is critical in ensuring the sustainability of the Institute and is therefore a top priority. In addition to training research leaders, we plan to increase the number of research positions through increased revenue generation. ▪ NRC-IFCI will allocate all its science and technology (S&T) A-base funding towards building internal research capabilities (core competencies) in low temperature and high temperature fuel cell technologies and in doing exploratory research. ▪ We will focus on the core competencies that are relevant to the industry with direction from the industry and an insight from market & technology intelligence studies to ensure our uniqueness. ▪ We will develop and implement staff training plan. ▪ We will put in place portfolio management process to ensure focus and sustainability.	• Developed a project selection process which is considered best practice within NRC • Achieved focus through reducing the number of projects to key projects focused on critical areas to industry • Increased the operating funds for projects from $300K to $800K. • Training plan is part of the business plan • Portfolio management is in place as part of the project selection process.
NRC-IFCI must ensure its research plan is focused and is within its resources, and clearly communicate it to stakeholders.	*Accepted.* ▪ NRC-IFCI will continue to focus by reducing the number of technology platforms for its internal R&D program. We will do this in consultation with industry technical committee and our university partners. ▪ We will continue to focus on building world-class	• Number of internal projects reduced to ten • More emphasis on key areas of core competencies. • Progress report design completed.

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Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
	expertise in fuel cell materials, design, and fabrication of fuel cells. ▪ Quarterly communication of progress to the Advisory Board and key stakeholders.	
NRC should consider all options, including work force adjustments, when making a significant shift in research focus.	*Accepted.* ▪ We are in the process of finalizing the restructuring that will include work force adjustment. The initial strategy was to allow time and resources for retraining the staff to meet the needs of the new mandate. Over the last two years we have been going through the process of realigning which will result in reorganization and work force adjustment. ▪ We will align our resources to deliver on the technology and business plan.	• Completed re-organization • New governance in place • Roles and responsibilities assigned
NRC-IFCI must focus on managing resources and implementing plans, and continue the development of management practices and processes to deliver against objectives.	*Accepted.* ▪ NRC-IFCI has developed a project review and planning process that allows us to manage the resources, review progress, and make decisions on new initiatives. ▪ We will continue to improve the process to maximize resource utilization. ▪ We will establish an Innovation Program Committee, consisting of group leaders and management, to regularly review progress, needs and priorities.	• Project manager was hired • Project review and selection was implemented • Resource allocation is in place • We have established a project leaders group that will review progress, needs and priorities
NRC needs to clearly articulate what is meant by "flagship" institutes and what roles and responsibilities are related to this.	The industry is requesting NRC to provide one portal, which coordinates and focuses resources within NRC. In our view NRC-IFCI can be the portal for fuel cell R&D because NRC-IFCI is an applied institute, located in the centre of the largest fuel cell cluster and has become the centre of activities for the fuel cell industry as a whole. It has the largest fuel cell research group in Canada and works closely	Discussions have taken place between NRC senior executives regarding NRC-IFCI becoming the lead Institute for fuel cell research in Canada. Further discussions are currently underway to clarify the definition around roles and responsibilities relating to the development of a 'portal'.

2006-2007 Evaluation of Central and Western Cluster Initiatives - Institute for Fuel Cell Innovation		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
	with its university partners to focus on meeting the needs of the industry. NRC-IFCI has become the hub that coordinates the fuel cell R&D community in Canada and interfaces with industry. Hydrogen & Fuel Cells Canada, the national industry association, is headquartered at NRC-IFCI and regularly communicates industry-involving needs. We have built strong relationships with industry and the universities and established strong links with international research organizations. In addition, NRC-IFCI, with its Industrial Partnership Facility (IPF)/testing/demo facilities, industry-led Advisory Board, and strong links with the NRC-IRAP ITA community, is very much aware of market and industry needs. So, as the portal, NRC-IFCI, on one side, can communicate those needs to the NRC FC Horizontal Program. The Horizontal Program will use that information to establish criteria for project selection that enables development of critical and yet novel knowledge platforms to be used by the applied institutes to support industry partners. And/or on the other side, NRC-IFCI can address multiple needs/requests from industry by linking them and/or their projects/consortia to appropriate NRC wide skills and expertise.	

2006-2007 Evaluation of Central and Western Cluster Initiatives – National Institute of Nanotechnology (NINT)		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
Articulate NINT's strategic vision and the specific mechanisms by which it will be achieved.	This recommendation will be implemented within the calendar year. NINT did have a plan for the first five years: to build, equip and populate NINT within a particular research framework articulated by Dan Wayner in 2002. Also, the strategic framework for operation was acknowledged by the Board in its first meeting in June 2005. However, in the past, approval of a formal strategic plan was hampered by a lack of understanding among the parties of what the strategic	The draft Strategic Plan was presented to the Board of Trustees in October 2006. Based upon their advice, the plan was developed further by NINT management for the April 2007 Board of Trustees meeting. At that time, the Board noted progress in the Plan, and asked for further strategy focus, for their purposes, compared to a related document submitted to NRC centrally. The next version of the plan is to be circulated electronically, for e-conference discussion, aiming for final

2006-2007 Evaluation of Central and Western Cluster Initiatives – National Institute of Nanotechnology (NINT)		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
	plan should include. It is the intent of management to develop a strategic plan that reflects the joint initiative and that can be approved by the NINT Board on October 3, 2006 as well as the funding partners of NINT. The strategic plan will provide clarity on the research plan and focus.	approval by the Board via an email poll. The "Nanotechnology Cluster Initiative" plan developed mainly by NINT and submitted by NRC (to Treasury Board as part of NRC's renewal proposal for its Phase II portfolio of cluster initiatives) principally focused upon NINT, and expressed the strategic plan for NINT in terms of its linkages to - and synergy with - the framework and priorities of NRC's new Strategic Plan, as well as the priorities of the other NINT founding partners. The NINT strategy was a strong influencer of the Alberta Nanotechnology Strategy (see below).
Address outstanding human resource issues and maintain as a priority for management.	The recommendation will be acted on immediately. The Director of Research position is a top priority with management and while the first search was not successful, creative alternatives are being pursued. The open recruitment process may be expanded within the framework of the federal government staffing process, which requires that an Internal Competition be followed by an External Competition. Other HR issues, such as long term career paths, will be brought forward for discussion between the principals in the two organizations, but it should be recognized that there may not be solutions to all of the career issues.	The position of Director of Research has been filled very capably on an acting basis by a veteran NRC senior manager,- the former acting DG for NINT, who also coordinates the cross-NRC nano initiative.
Clarify the role and responsibilities of the Board of Trustees.	The role of the Board of Trustees is defined in the Governance Agreement for NINT. As the Board continues to meet regularly and NINT is fully established, the responsibilities of the Board will become more definite. To ensure that the Board's role reflects the partners' expectations, one-on-one interviews with partners and Board members will be initiated and results will be reported at the next Board meeting.	At the joint meeting of the NINT Board of Trustees and the NINT Oversight Committee in October 2006, the Board of Trustees recommended to the NINT founding members that they form an executive subcommittee of the Board that would be responsible for NINT operational issues. This committee was formed, and has since updated the NINT governance document in line with the Oversight Committee and the Board's recommendations. The formation of the new committee will allow the Board of Trustees to focus on strategic directions for NINT, reducing their agenda occupied with integrating the operational frameworks of the partners. The NINT Oversight Committee met with,

2006-2007 Evaluation of Central and Western Cluster Initiatives – National Institute of Nanotechnology (NINT)		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
		and provided advice as to the role of the Board of Trustees at their April meeting.
Refine administrative systems.	This recommendation will be implemented to the extent possible. The NRC personnel at NINT and the University of Alberta personnel are continually working on finding the most effective ways of working together. A number of agreements have been signed, but more need to be implemented. Special communication efforts will be made to make the processes more open and clear for everyone.	The newly formed executive sub-committee of the Board of Trustees works with the Director General of NINT to ensure that the founding members work together effectively. The DG and the University of Alberta VP-Research meet regularly to facilitate the integration of their organizational frameworks and priorities. A common NRC-U of A Ethics approval regimen is under development. An ad-hoc working group on administrative issues has been formed between NINT and U of A counterparts. Other teams of NRC-University of Alberta interconnectivity are nurtured, e.g., relating to building operations, visiting worker processes, scientific cross appointments, joint marketing, cross supply of services.
Finalize the communication protocol and develop a communication plan.	This recommendation is critical and attention will be given to getting the communications protocol agreed upon and signed. The major principles are in place and a protocol has been developed and agreed upon in principle. The communications strategy needs to be developed and is important as NINT moves from a responsive to a proactive phase.	The Director General of NINT has drafted a communications protocol for the Executive Committee's approval. The Protocol is a living document, and within its basic philosophy, refinements are added at the working level as the relationships further coalesce.
Secure sustainable levels of ongoing funding.	This recommendation is being acted on immediately. The outcome of the evaluation process is feeding into the business plan for NRC renewal request to the Government of Canada. In parallel, the Government of Alberta is developing a Nanotechnology Strategy that recognizes the critical role of NINT for Alberta.	NRC has made its request to the federal government, within the Cluster II funding renewal proposal. The Government of Alberta's Nanotechnology Strategy was released in May 2007. The $130 million investment over five years, presents 16 funding elements aimed at encouraging commercialization, attracting and retaining talent, and creating and sustaining infrastructure. Many elements represent funding opportunities for NINT.

2006-2007 Evaluation of Central and Western Cluster Initiatives – Crops for Enhanced Human Health (CEHH)		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
CEHH should increase linkages to the medical and nutritional research community working in the field of functional foods and nutraceuticals (FFN).	*Accepted.* NRC-PBI has currently begun establishing linkages with the medical and nutritional community at the University of Saskatchewan and NRC's Institute for Nutrisciences and Health (NRC-INH) in Prince Edward Island (PEI).	In 2006-2007, NRC-PBI sponsored a joint medical/nutritional/research workshop with Canadian industry and universities. In addition, NRC-PBI researchers are forming formal linkages researchers at the University of Manitoba, and are in discussions with l'Institut des nutraceutiques et des aliments fonctionnels of Laval University, Advanced Food and Materials Network (AFMNet), and Canadian Centre for Agri-food Research in Health and Medicine (CCARM) on potential co-operative activities. As well, NRC-PBI is pursuing more formal linkages with NRC-INH. There are currently two joint projects underway between these two institutes. NRC-PBI has been in discussions regarding a more formal, broader arrangement with respect to research and a possible expansion of BioAccess into Atlantic Canada. In November 2006, the BioAccess Commercialization Centre opened in Saskatoon. The Centre was created by NRC to assist innovative firms in Western Canada's nutraceutical, functional food and natural health products industries as they bring products to market. NRC services include research expertise, business development support programs, expert business knowledge, resources and advice.
CEHH should develop a operational/business plan clearly outlining commitments and timelines for any future activities should additional technology cluster initiative funding be received.	*Accepted.* NRC-PBI will develop an operational plan in consultation with NRC-IRAP, NRC-CISTI and the BioInnovation Centre to support all facets of the cluster as outlined in its business plan.	The plan is currently under development and is expected to be finalized by December 2007. In addition, NRC-PBI is currently developing management and project management systems.
CEHH should develop a communications plan to guide future outreach efforts with the FFN cluster players. The plan should include strategies to communicate with cluster actors in the research/academic community as well as other stakeholders and industry.	*Accepted.* As part of its business planning, NRC-PBI has identified outreach and communications planning as critical to providing momentum in the community to develop the cluster.	NRC-PBI's Information Officer developed a communications plan but implementation is on hold as the individual holding this position left and a replacement has not yet been found. It is expected that an interim replacement will be hired by August 2007, and formal hiring of a continuing person will be completed in December 2007. BioAccess is well engaged in its communications outreach activities. Promotional material has been completed, a technology roadmapping exercise has begun and a BioMap workshop was held in November 2006 with SMEs across Western Canada. In addition, BioAccess is

2006-2007 Evaluation of Central and Western Cluster Initiatives – Crops for Enhanced Human Health (CEHH)		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
		producing a newsletter, to be completed in September 2007, that will update industry in Western Canada on key technological/product achievements as well as provide information on commercialization and business issues. NRC-PBI held two workshops with industry and public research participant from across Canada to enhance awareness and cluster partnerships. Another such event is planned for December 2007.

2006-2007 Evaluation of Central and Western Cluster Initiatives – Centre for the Commercialization of Biomedical Technology (NRC-CCBT)		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
NRC-IBD should establish an accountability framework between NRC-IBD and BCC to clarify the roles and responsibilities of the two organizations, particularly relating to tenancy arrangements of NRC-CCBT.	*In progress.* Leasable space in NRC-CCBT is already 48% occupied, only nine months after building completion. For the remaining space, in accordance with the IBD-BCC Memorandum of Collaboration setting out each Party's responsibilities, NRC-IBD will consult with BCC to determine space requirements in the next 12 months. For space *not* required by BCC, NRC-IBD will seek tenants and organizations that will not be in the BCC program, so as not to compete with BCC program objectives.	As at 1 April 2007, leasable space in CCBT was 61% occupied. The total number of tenants in CCBT as at 1 April 2007 was nine, with four tenants enrolled in the BCC program and all nine tenants are related to the Biomedical Cluster. Through the Steering Committee meetings, BCC has advised NRC that there are plans for four additional clients for the BCC Program.
Given the significant amount of space within NRC-CCBT allocated to BCC, NRC-IBD should ensure that BCC has a current business plan in place outlining timelines, milestones and contingency plans for finding and securing appropriate clients for the allocated space and for participating in BCC programs.	*Completed.* BCC has a current Business Plan and Work Plan, submitted to its Board of Directors in March 2006. BCC also reports progress to NRC-IRAP monthly.	BCC has a current Business Plan in place and reports progress to NRC-IRAP monthly.
As per the Memorandum of Collaboration between NRC-IBD and BCC, NRC-IBD	*Accepted.* Planning meetings have been ongoing since 10/2005 and carried out on an *ad hoc* basis to date. Joint	In addition to the *ad hoc* meetings, there were several formal Steering Committee meetings, which were held on the following dates in FY

2006-2007 Evaluation of Central and Western Cluster Initiatives – Centre for the Commercialization of Biomedical Technology (NRC-CCBT)		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
should ensure formal meetings of the Joint Steering Committee take place and appropriate mechanisms are established to monitor progress against commitments outlined in the MOC and to meet federal government accountability requirements.	Steering Committee meetings will commence in Q4 2006. These meetings will utilize agendas and actions arising to monitor progress against commitments.	2006-07: • 3 October, 2006 • 13 November 2006 • 15 January 2007

2006-2007 Evaluation of Central and Western Cluster Initiatives – Aluminium Technology Centre (NRC-ATC)		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
Fast-track the planned undertaking of needs analysis within local industry in the SLSJ region to determine opportunities related to the technology platforms that are being put in place in NRC-ATC.	*Accepted*. The Canadian Aluminium Transformation Technology Roadmap of which NRC is a key stakeholder, will bring forward national and local industry needs. Through a number of workshops those firms are voicing their views on the sector priorities and their challenges to answer them.	The 2006 edition of the Canadian Aluminium Transformation Technology Roadmap was published on March 31st 2007 in Saguenay. The document is freely available on the internet in French and English: http://www.trans-al.com/Default.aspx?alias=www.trans-al.com/en. Several presentations have followed the official launch of the document in the province of Quebec. The document was also distributed in Ontario during Automotive Parts Manufacturers' Association's exhibition in Hamilton in May 2007.
	An integrated approach with all stakeholders of the cluster in order to develop programs and services dedicated to the need of SMEs, in particular. • NRC-ATC/IRAP/CISTI will introduce new joint activities to provide competitive technical intelligence and an information hub for industries mainly for SMEs. • NRC-ATC and NRC-IRAP will work together for the creation of new R&D programs dedicated to the needs of SMEs and in line with the objectives of cluster stakeholders such as CED, CQRDA, TRANSAL, APMA,	The past year was the initial phase. Efforts were made to assess the actual needs of NRC-ATC and the aluminium cluster. Most of the activities occurred since January 2007. These activities were aimed at familiarizing the newly appointed NRC Information Centre (NIC) Saguenay Head with the cluster activities and players in order to evaluate their needs. NRC-CISTI's regional coordinator and NIC Saguenay Head worked closely with ATC management and NRC-IRAP ITA to align the potential service offerings with those needs. • A dedicated ITA has been confirmed to be the NRC-IRAP link with the ATC and the aluminium cluster. • Two other ITAs have been confirmed to act as the liaison officers

2006-2007 Evaluation of Central and Western Cluster Initiatives – Aluminium Technology Centre (NRC-ATC)		
	REGAL and other Canadian universities. • NRC-ATC and NRC-IRAP plan is to effectively reach out for industries not only in the Saguenay-Lac-Saint-Jean region but all across Canada. Using the same successful vehicle that has been used at IMI-Boucherville, multi-partners projects will be created to address common opportunities and issues of SMEs.	between the NRC-ATC/Aluminium Cluster with the aluminium industries in Ontario and British Columbia. They will be working together with the dedicated ITAs from Quebec. • The dedicated ITA is actively involved in the entire incoming request for collaboration between SMEs and the NRC-ATC. • The ITA is also involved with NRC-CISTI to implement the other activities from the plan.
Examine the management of IP with key collaborators to ensure access to new knowledge by members of the 'cluster' community.	*Accepted (with clarification).* The approach used so far with our key collaborators has been to maximize the speed of commercialization, knowledge generation for NRC-ATC, access to facilities and transfer of expertise for the other users in the cluster or in Canada. The agreements signed by NRC-ATC will continue to maximize the NRC's strategic objectives allowing knowledge transfer to other users of the cluster community to create wealth, jobs and benefits for Canada.	Special emphasis has been put in 2006-2007 on identification of IP issues and appropriate IP agreements for all new projects. The IP section of contracts is defined by ATC's Business Development Officer, in consultation with NRC's IP lawyer. The IP agreement is further reviewed at NRC-IMI's project review committee, before contract signature. This results in project-specific IP agreements , even when multiple projects are done with the same industrial partner • The ATC offers to its partners an easy access to a world-class expertise and unique S&T infrastructures in an open-lab concept to facilitate collaboration and joint activities. • The NRC-ATC has established a new collaboration with an SME from the region allowing for a unique Friction-Stir Welding laboratory to be located at their premises. This was facilitated by collaboration with the NRC-AMTC (Aerospace Manufacturing Technology Centre) which is part of part of the NRC-IAR (Institute for Aerospace Research) (complementary facilities and expertise). The NRC-ATC also has ongoing activities with other SMEs, in the region, to facilitate their access to its S&T infrastructures and resources.

2006-2007 Evaluation of Central and Western Cluster Initiatives – Canadian Photonics Fabrication Centre (NRC-CPFC)		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
Seek out additional opportunities to inform, educate and build relationships with NRC-IRAP ITAs.	*Accepted.* NRC-CPFC views NRC-IRAP as a critical partner in diffusing its business offering to the Canadian industrial sector – an extension to its 'sales and marketing force'. NRC-IMS management will meet with the Director General of	NRC-CPFC management had three separate meetings with NRC-IRAP management (Director General and Ontario Director) to lay out a strategy for the full integration of the NRC-CPFC into the NRC-IRAP offering. It was agreed that the Director of the NRC-CPFC would be

2006-2007 Evaluation of Central and Western Cluster Initiatives – Canadian Photonics Fabrication Centre (NRC-CPFC)		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
	NRC-IRAP to identify the best way of informing Industrial Technology Advisors of NRC-CPFC commercial programs and services.	invited to future regional ITA meetings to give an overview of this cluster initiative and what it could do for their clients. NRC-IRAP gave a presentation to NRC-IMS management and group leaders on NRC-IRAP's positioning to help market NRC-IMS's capabilities. NRC-IMS hosted a return visit by several NRC-IRAP ITAs where NRC-IMS gave presentations on its R&D programs, on the NRC-CPFC and how it engages with clients. This highlighted a number of activities which are believed to be ready for commercial exploitation. Two clients have already been identified by NRC-IRAP and business opportunities with the NRC-CPFC are being explored.
Continue to extend and link to the private sector as a means of making the services of NRC-CPFC known.	*Accepted.* This is core to what NRC-CPFC must do – insuring diffusion of NRC-CPFC service offering to the industrial sector. NRC-CPFC will do so by making sure all of its business office staff members are fully integrated in the business practices of NRC-CPFC. NRC-CPFC will also continue to attend trade shows such as Photonics North and West as well as sit on committees of 'photonics industry associations' to inform potential industrial clients.	An NRC-IRAP ITA focusing on Photonics has been designated as a key contact point for NRC-IRAP staff wishing to access NRC-CPFC expertise. It has also been agreed that NRC-CPFC will be highlighted at a number of NRC-IRAP regional meetings in Ontario, Quebec, Atlantic and Western Canada over the next 12 months. NRC-IRAP ITAs will be supporting the NRC-IMS Business Office and NRC-CPFC at the next Photonics North event, including the NRC-CPFC's Executive Symposium on Commercialization.
Resolve attribution of property tax and hydro costs.	*Accepted.* NRC-IMS management will meet with the DG of ASPM to estimate the true utilities cost and taxes of CPFC complex. Note, every day of service interruption affecting the CPFC results in a minimum of 2 days of shut down which cost CPFC $50,000 in lost opportunity. ASPM needs to be sensitive to such pressures.	The average cost of utilities and taxes have been estimated for operations over the last two years, and have been included in the NRC-CPFC business plan; it is anticipated that these will be fully covered by the budget request submitted to Treasury Board. NRC-IMS management continues to work closely with NRC-ASPM to minimize the interruption of services. Campus-wide power interruptions (for periodic maintenance by Hydro Ottawa) still result in a complete shutdown of the facility, as happened recently. In spite of forward planning, almost twp days of operation were lost.
Examine market potential and set cost-recovery expectations for the NRC-CPFC.	*Accepted.* CPFC will continue to update its marketing plan on a regular basis and seek guidance from other international organizations (such as OIDA) in doing so. As established in the original Treasury Board submission, the CPFC's cost recovery policy is meant to cover some but by no means all of the operational costs of CPFC. The impact of	NRC-CPFC has continued to be active in searching out new business opportunities both in Canada and internationally. The costs charged for fabrication services have been fully evaluated using standard NRC accounting principle and appear to be competitive. Some of the key metrics which have been identified for this sector are related to the industrial impact of the NRC-CPFC. These can be measured by the

2006-2007 Evaluation of Central and Western Cluster Initiatives – Canadian Photonics Fabrication Centre (NRC-CPFC)		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
	CPFC will be measured by its effectiveness in stimulating the Canadian economy (job growth, SME traction, VC investment, commercial product on the market, etc.). CPFC will continue to run its bi-weekly business/marketing meeting to looking at CPFC forecasted revenues.	growth of client firms (from attraction of investment, increase in revenue, and increase in jobs). The NRC-CPFC management understand the delicate balance which exists for a maximized returned on investment. The NRC-CPFC will continue to monitor market pricing for similar services to ensure we are providing our clients with best value. Keeping track of these metrics will be one of the responsibilities of the new NRC-CPFC Technical Marketing person.
Establish a joint Results Based Measurement and Accountability Framework (RMAF) that takes into account the contributions, of funding, or program delivery of collaborators.	*This recommendation is not accepted.* Carleton University is responsible for the training program and has received funds from the province to do so. NRC has no jurisdiction or authority in this area, although the NRC-CPFC is represented on the formal training program of Carleton University.	*This recommendation is not accepted.*
Continue to develop marketing and communication strategies, especially those directed directly at firms, including firms in Ottawa.	*Accepted.* As stated previously, marketing and communication is key for a business unit such as the CPFC and a tool which needs to be exploited. CPFC will continue to obtain marketing and competitive intelligence using its internal BO forces and will try to integrate better with NRC-CISTI resources. As such, in its proposed business plan (2007-12), the CPFC anticipates partnering with NRC-CISTI to obtain competitive technical intelligence which will be distilled and analyzed to help identify CPFC's threats and opportunities – the results will be integrated in its business decision making process. On the communication front, the CPFC will continue to keep its website updated and disseminate its service offering to its stakeholders. A senior communication agent will be hired by the CPFC to perform these duties.	Four meetings have been held between NRC-IMS and NRC-CISTI to define the profile of the Technology Business Analyst position within NRC-CISTI. A written test for screening applicants is being developed. A poster for a Business Development Officer in Technical Marketing for the NRC-CPFC is being finalized and will be posted shortly. Updated brochures are being prepared about the NRC-CPFC, the content of which will also be used to augment our website. The NRC-CPFC has also been pro-active in strengthening existing relationship with regional industry-led photonics clusters (including Ottawa, Montreal, Quebec, British Columbia, Southern Ontario, Rochester, Tucson, Phoenix, San Jose, Pittsburgh and Boston) and is looking to establishing new relationships with other international photonics clusters (France, Italy, Spain, China, Florida, North Carolina, Colorado). To this purpose, CPFC obtained an ERI funded project to enhance its presence as well as its customers' presence in U.S. markets.

2006-2007 Evaluation of Central and Western Cluster Initiatives – Canadian Photonics Fabrication Centre (NRC-CPFC)		
Recommendation	Management Response and Proposed Actions	Progress Made in 2006-2007
Conduct a benchmarking study in approximately five years to gauge the position and strength of NRC-CPFC offering in relation to other centres.	*Accepted with changes.* Although CPFC agrees that a benchmarking study would be needed in comparing the CPFC's strengths and weaknesses in relation to other Centres, it needs to be done before the five-year mark. In fact, this exercise should be done on an on-going fashion as part of the marketing plan and concurrently with updating the CPFC technology roadmap - both set of data are needed in order to complete a comprehensive analysis of the competitive offering of the Centre.	The NRC-CPFC has taken a leadership position in bringing together Ontario Centres of Excellence, DRDC, International Trade, Réseau photonique du Québec, Institut national en optique photonique, CMC Microsystems and the Provincial Governments of BC and Alberta to conduct a National Benchmarking Study in Photonics, which will include photonics firms from across Canada. This study is being carried out under the umbrella of a Canadian Photonics Consortium Committee which is chaired by the Director of NRC-CPFC. The report is due in May 2008.
Examine communication policies given the NRC-government of Ontario/Carleton University partnership.	*Accepted*. This will depend of course on the continued support of the province of Ontario and Carleton University moving forward. So far, no major communication problems have been encountered between the three stakeholders. Carleton University and the Province of Ontario are quite amiable to calling the Centre 'NRC's CPFC'.	Senior executives from Carleton University and NRC have met with their equivalent in the Ontario government to position the NRC-CPFC for the next round of provincial government funding. Carleton University and NRC are working together on this next proposal. Carleton University and NRC also worked together on a submission to NSERC for a major facilities access (MFA) grant which would have allowed increased access (one day per week) to the NRC-CPFC for projects originating from Canadian University researchers. Although this application was not successful, the support from the academic user community and the feedback from the review committee were both very positive.

Table 3-12: Horizontal Initiatives
NRC is the lead on the Genomics R&D Initiative. Supplementary information on Horizontal Initiatives can be found at http://www.tbs-sct.gc.ca/rma/dpr3/06-07/index_e.asp.

Table 3-13: Travel Policies
NRC follows Treasury Board Secretariat's Travel policies and parameters. NRC does not have any Special Travel Authorities.

Table 3-14: Storage Tanks
A letter regarding the status of storage tanks on NRC-owned land was sent to the Minister of the Environment on 3 April 2007.

Section IV – Other Items of Interest

Awards and Achievements

- Aitken, J. NRC-IAR
  Canadian Aeronautics and Space Institute Trans Canada (McKee) trophy, Canadian Aeronautics and Space Institute
- Arsenault, C., Duval, C., Newsham, G., Tosco, A., Veitch, J. NRC-IRC
  2006 Taylor Technical Talent Award, for the paper "Task Lighting Effects on Office Worker Satisfaction and Performance, and Energy Efficiency," Illuminating Engineering Society of North America
- Atif, M. NRC-IRC
  Re-elected as Chairman of the International Energy Agency Executive Committee of the Energy Conservation for Buildings and Community Systems Programme (ECBCS), ECBCS
- Baker, H. NRC-IRC
  Fellowship of the EIC, nominated by the Canadian Geotechnical Society for his excellent service to the geotechnical and geoscience communities, Engineering Institute of Canada
- Beaulieu, D., Brothers, M., Campbell, R., Chen, J., Chouinard, G., Delannoy, M. I., Dicaire, P., Djokic, D.,Ferguson, P., Fisher, K., Harrison, M., Hojjati, M., Kay, T., Kratz, J., Laliberté, J., Lalonde, J., Luteyn, A., Moyes, B., Octeau, M-A., Rogers, J., Shane, D., Tanguay, M., Yousefpour, A. NRC-IAR
  Partnership Award 2006 with their partners on this project, Delastek, Bell Helicopter, Concordia University, and Pratt & Whitney Canada, Association de la Recherche Industrielle du Québec (ADRIQ).
- Black, R. NRC-IRAP
  Fellow of the Canadian Medical and Biological Engineering Society, Canadian Medical and Biological Engineering Society
- Blanchet, C., Newsham, G., Richardson, C., Veitch, J. NRC-IRC
  2006 Walsh Weston Award, for the paper "Lighting Quality Research Using Rendered Images of Offices," Society of Light and Lighting
- Borgeat, L., Poirier, G., Taylor, J., Blais, F., Cournoyer, L., Picard, M., Godin, G., Beraldin, J-A., Lahanier, C., Rioux, M. NRC-IIT
  2nd prize, Scientific and Engineering Visualization Challenge 2006, National Science Foundation, USA
- Boyd, R. NRC-IMB/NRC-INMS
  Issue of "Rapid Communications in Mass Spectrometry," 30 May 2006 was dedicated to him.
- Buriak, J. NINT
  E. W. R. Steacie Memorial Fellowship, NSERC
- Caikang, K.F., Gu, E., Henry, S., Hernandez, M., Hesser, R., Hu, C., Jankovic, J., Martin, J. J., Vázquez, O. H., Veljkovic, M., Wang, H. NRC-IFCI
  Public Service Award of Excellence, Public Service Commission
- Charbonneau, S. NRC-IMS
  Technology Partnership Award, Ottawa Centre for Research and Innovation (OCRI)

- Corkum, P. NRC-SIMS
  Killam Prize, Canada Council for the Arts
- Corkum, P. NRC-SIMS
  Arthur L. Schawlow Prize in Laser Science, American Physical Society
- Corkum, P. NRC-SIMS
  Honorary PhD, Acadia University
- Crampton, G., Cunningham, H., Kim, A. NRC-IRC
  Federal Partners in Technology Transfer (FPTT) 2006 award for "the successful transfer and commercialization of the Compressed-air Foam fixed pipe technology," Federal Partners in Technology Transfer
- D'Iorio, M. NRC-IMS
  Fellow of the Royal Society of Canada, Royal Society of Canada
- Erdogmus, H. NRC-IIT
  Appointed Editor-in-Chief of IEEE Software Magazine, Institute for Electrical and Electronics Engineers Software Magazine
- Ferrie, A. NRC-PBI
  Appointed National Correspondent for the International Association for Plant Biotechnology (IAPB)
- Gosselin, G. NRC-IRC
  Fellowships of the Engineering Institute of Canada and the Canadian Society for Civil Engineering, Engineering Institute of Canada; Canadian Society of Civil Engineering.
- Gupta, J. NRC-IMS
  National Capital Institute for Telecommunications (NCIT) Under 40 Award for photonics research, Ottawa Centre for Research and Innovation (OCRI)
- Hawrylak, P. NRC-IMS
  Fellow of the Royal Society of Canada, Royal Society of Canada
- Jahazzi, M. NRC-IAR
  2006 Morris Cohen Award recognizing Outstanding Contribution to Failure Analysis of Aerospace components, Materials Integrity & Performance Section of the Canadian Metallurgical Society
- Jennings, H. J. NRC-IBS
  Prix Galien Canada (Research) 2006, Prix Galien Canada
- Johnston, A. NRC-IAR, Hubert, M. P. McGill University
  Achievement Award for their contribution developments in Electron Beam Curing of Composite Materials structures, The Technical Collaboration Program (TTCP) Panel MAT TP6/TP7
- Ledoux, J-J. NRC-IMS
  CABI President's Award, Canadian Association of Business Incubators
- Liu, H.C. NRC-IMS
  IEEE Fellow, Institute for Electrical and Electronics Engineers (IEEE)
- Liu, F., Smallwood, G., Snelling, D. NRC-ICPET
  Fast Breaking Paper, Distinction of having the highest percentage increase in citations among the top 1% of all Engineering papers indexed by ESI, Thomson Scientific – Essential Science Indicators
- Luong, J. NRC-BRI
  Walton Visitor Award, Science Foundation Ireland, Ireland, March 2007

- MacDougall, B. NRC-ICPET
  Elected Fellow, Electrochemical Society
- Madej, A. NRC-INMS
  NSERC Discovery Research Grant “High Resolution studies of a Single Trapped Ion and its Environment and Quantum State Manipulation”, Natural Sciences and Engineering Research Council of Canada
- Magee, B. NRC-IRC
  ASTM Award of Appreciation, for outstanding service to ASTM Committee D22 on Air Quality, and Subcommittee D22.05 on Indoor Air, for organizing and chairing the 2004 Conference on Indoor Emissions Testing - Methods and Interpretation, and for his on-going service to Subcommittee D22.05 on Indoor Air, ASTM
- McCreery, R. NINT
  Ernest Yeager Award, Cleveland Electrochemical Society Section
- McCreery, R. NINT
  Alberta Ingenuity Scholar, Alberta Ingenuity
- Moreau, C. NRC-IMI
  Élu « Fellow » de l’ASM International, ASM International
- Moreau, C. NRC-IMI
  G. MacDonald Young Award, American Society for Metals Canada Council (ASMCC)
- Nowark, A. NRC-IBD
  Governor General’s Silver Medal, Governor General, May 2006
- Paroli, R. NRC-IRC
  CSASS Distinguished Service Award, Canadian Society for Analytical Sciences and Spectroscopy
- Proulx, G. NRC-IRC
  Elected to serve on the Board of Directors of the Society of Fire Protection Engineers (SFPE), Society of Fire Protection Engineers
- Rogge, R. NRC-SIMS
  Thirty From the Past Thirty Years Award, Brock University Alumni Association
- Rowell, N., Baribeau, J.-M. NRC-INMS, Lockwood, D. NRC-IMS
  Journal of Physics: Condensed Matter Top Papers of 2006, "Ge dots and nanostructures grown epitaxially on Si", Journal of Physics: Condensed Matter (JPCM)
- Sabsabi, M. NRC-IMI
  Certificate of Appreciation for High Scientific Level of the LIBS 2006 Program. Delivered by the previous chairman of the LIBS conferences, LIBS 2006
- Smallwood, G. NRC-ICPET
  Forest R. McFarland Award for serving with Distinction as a key contributor, Society for Automotive Engineers
- Smith, I. NRC-IBD
  Named a Paul Harris Fellow, Rotary Club of Winnipeg-Assiniboine
- Smith, I. NRC-IBD
  Honorary Professor, Institute of Nuclear Physics, Polish Academy of Sciences, June 2006
- Stetson, P. NRC-HIA
  Fellow of the Royal Society of Canada, Royal Society of Canada
- Sturgeon, R. NRC-INMS
  Maxxam Award for "distinguished contribution in the field of analytical chemistry while working in Canada", Canadian Society for Chemistry

- Timco, G. NRC-CHC
  Thirty from the Past Thirty, Brock University Alumni Association
- Valzano, V., Beraldin, J.-A. NRC-IIT
  1st prize category eScience, eContent Award Italy, Fondazione Politechnico di Milano, part of United Nations World Summit on information society
- Veitch, J. NRC-IRC
  Fellowship of the CPA, Canadian Psychological Association (CPA)
- Viktor, H. L., Paquet, E. NRC-IIT
  Principles and Practice of Knowledge Discovery in Databases Innovative Application Award for “Measuring to Fit: Virtual Tailoring through Cluster Analysis and Classification”, ECML – PKDD, 17th European Conference on Machine Learning and the 10th European Conference on Principles and Practice of Knowledge Discovery in Databases, Berlin, Germany
- Villeneuve, D. NRC-SIMS
  Fellowship, American Physical Society, American Physical Society
- Wickramasinghe, V., Zimcik, D. G. NRC-IAR
  Achievement Award for their contributions to the TTCP-TP4 Operating Assignment on “Next Generation Active Buffeting Induced Stress Suppression System," The Technical Collaboration Program (TTCP)
- Wood, B. NRC-INMS
  Elected Fellow of Institute of Electrical and Electronics Engineers, IEEE
- Wood, B. NRC-INMS
  Astin Award 2006—"Best Overall Paper at the 2006 Conference" (first Canadian to win the award), National Conference of Standards Laboratories International (NCSLI) Conference 2006
- Wood, B. NRC-INMS
  Chairmanship of CODATA Task Group on Fundamental Constants (first Canadian to hold the position), Scientific Committee of the International Council for Science (ICSU)
- Wu, L. NRC-INMS
  Vice-chair, CSC/IEC/TC29 Electroacoustics, Standards Council of Canada
- Yousefi, A. M. NRC-IMI
  Mention remarquable par la compagnie YAPP pour la formation en Chine, Compagnie YAPP

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Institute for Microstructural Sciences (NRC-IMS) – Ottawa, ON
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Institute for National Measurement Standards (NRC-INMS) – Ottawa, ON
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National Institute for Nanotechnology (NINT) – Edmonton, AB
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Steacie Institute for Molecular Sciences (NRC-SIMS) – Ottawa and Chalk River, ON
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