

The logo graphic features a stylized red maple leaf on the left, partially enclosed by a white arc. To the right of the leaf is a white starburst. The background is a dark blue gradient with a white arc and a thin orange line.

NRC-CNRC

From **Discovery**
to **Innovation...**

Science
—at work for—
Canada

National Research Council Canada

Annual Report

2006 – 2007



National Research
Council Canada

Conseil national
de recherches Canada

Canada

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MINISTER'S MESSAGE



The National Research Council's annual report for 2006–2007 reflects a year of accomplishment that supports the directions of Canada's federal S&T strategy, *Mobilizing Science and Technology to Canada's Advantage*.

Science and technology are vital for realizing health, environmental, societal, and economic benefits, which will ultimately generate wealth and promote a better quality of life for Canadians.

When Canadian researchers, innovators and entrepreneurs develop new ideas and bring them to the marketplace, they contribute to our strong economy. True, we are facing global pressures including technological advances, new trade agreements, and the emerging roles of developing countries. Although these changes can impact our business environment, Canada must keep pace and we need to seize new opportunities.

Part of my mandate, through the collective organizations that form the Industry Portfolio, is to increase Canadian productivity and competitiveness. By ensuring that our industries grow, Canadians will continue to enjoy one of the highest standards of living in the world. But with that economic prosperity comes a need for responsibility and balance. Scientific and engineering progress can also assist industry sectors in creating and adopting cleaner, greener operations to protect the environment and the health of Canadians.

The fundamental importance of science and technology to our economy and quality of life is recognized in *Advantage Canada*, the government's long-term economic plan. We accomplished much this year by following that plan together with the federal S&T strategy, *Mobilizing Science and Technology to Canada's Advantage*, as our roadmap. We will continue to focus on these goals to support the conditions for a strong economy—an environment that Canadians expect and deserve.

Jim Prentice
Minister of Industry

INTRODUCTION

The National Research Council (NRC) is Canada's leading federally funded resource for science and technology (S&T) development and commercialization. Over the years, NRC has consistently demonstrated its worth by identifying Canada's S&T-based opportunities and adapting its R&D, industry support and commercialization services, programs and networks to meet national needs and priorities. Fiscal year 2006-2007 was no exception.

New Business Strategy

In 2006, following earlier industry and stakeholder consultations, NRC launched and began implementing its new corporate vision and business strategy, *Science at Work for Canada*. Building on its established strengths and capacities – from its highly qualified employees and their vast S&T networks to unique Canadian facilities and multi-disciplinary collaborations – NRC will deliver on its strategy for 2007 to 2011.

Focused R&D Programs to Meet Canada's Needs

NRC is continuing to work with universities, industry and other government departments and S&T organizations to help Canada lead in important areas of technology, particularly those that respond to three national priorities: protecting the health and wellness of Canadians; safeguarding the environment; and developing sustainable energy. Many of the successful research projects and strategic collaborations described in this report are grouped under those three priorities.

While NRC contributes significantly to specific industry sectors with direct connections to the three national priorities mentioned above, NRC also helps strengthen other sectors of Canadian industry, particularly high-impact and emerging sectors of Canada's economy. The new NRC business strategy called for the identification and development of key sectors of activity which, from 2007 to 2011, would benefit most from NRC's expertise and produce the most impact for Canada. In early 2007, NRC announced that it would focus on aerospace, pharmaceuticals and biotechnology, construction, information and communication technologies (ICT), agriculture, chemicals, automotive, electronic instruments, manufacturing, and materials engineering. NRC began developing targeted R&D and innovation support strategies to ensure maximum use of its resources to help these sectors become more competitive.

National Programs

Another important component of NRC's strategy is its national programs. In 2006-2007, NRC selected the R&D focus for national programs that will be implemented over the next few years. The first such program, announced in January 2007, is a bioproducts R&D national program. University stakeholders and other major S&T organizations in Canada saw NRC as the best positioned national organization to lead this important initiative because NRC had been active in related fields since launching its biotechnology program in 1983. NRC is now seeking to establish partnerships with other federal departments with a stake in bioproducts, especially for the development of biofuels, industrial biomaterials and chemicals, as well as health products. NRC's objective is to bring together the collective expertise and resources of key stakeholders, including industry partners, to achieve the critical mass of experts and R&D programs to help Canada reach its full potential in this area. The bioproducts program will begin in 2008, with other national programs to follow.

Supporting Technology-driven Companies

In 2006-2007, NRC worked with many of Canada's technology-driven small and medium-sized enterprises (SMEs), providing financial and technical assistance to those with the potential to lead in a new area of technology. As it has done for several years, NRC gave these firms access to top research expertise and networks as well as Canada's best collection of current S&T information. NRC provided design, testing and calibration services, laboratory space, business development and commercialization support, and help with intellectual property. NRC also offered firms the opportunity to co-locate with NRC in facilities designed to help them develop new technology and prepare for the marketplace.

Community Innovation

Throughout the year, NRC accomplished a great deal in its initiatives to help strengthen Canada's national innovation and commercialization capacity at the community level. The 11 technology cluster initiatives that NRC helped to establish across the nation are gaining traction in sectors vital to our future. These clusters include: photonics, nanotechnology, IT and e-business, nutrisciences and health, biomedical technologies, plants for health and wellness, ocean technologies, sustainable infrastructure, aluminium transformation, life sciences, and fuel cell and hydrogen technologies. NRC also plays a key role in other well-established clusters in Canadian communities, such as biopharmaceutical and aerospace clusters.

Throughout 2006-2007, NRC worked closely with industry, government and academia to increase the competitiveness of Canadian industry through S&T. It has mobilized the public and private sectors to invest in new S&T initiatives and research facilities, and to strengthen NRC technology cluster initiatives across Canada. Through the NRC Industrial Research Assistance Program (NRC-IRAP), a coast-to-coast network of NRC industry partnership facilities (IPFs), and the NRC Canada Institute for Scientific and Technical Information (NRC-CISTI), NRC has helped many innovative firms adopt new technologies, develop new products and services, access leading-edge S&T information, grow their networks, and become more competitive in today's markets.

Getting Canadians Excited About S&T

In 2006-2007, NRC took extra steps to raise awareness about Canada's past S&T advances as well as the importance of S&T for this country's future. To coincide with its 90th anniversary, NRC developed and distributed a Canadian S&T timeline poster for students, and launched a Web site highlighting nine decades of accomplishment and reiterating NRC's role in stimulating innovation in Canada. NRC also prepared a book to showcase its historical S&T accomplishments and is planning a public display of selected milestones through highly visible banners at its Sussex Drive facility for the peak 2007 Ottawa tourism season. This outdoor exhibit will align past successes with future S&T opportunities for Canada through NRC's key sectors.

To reach national and international audiences, NRC began distributing *NRC Newslink* and *From Discovery to Innovation: Building a Stronger Canada through Science and Technology*, quarterly and annual publications targeting S&T stakeholders in industry and universities as well as government decision makers. In February 2007, NRC took the opportunity to display its accomplishments to MPs and senators at an exhibit on Parliament Hill. NRC will continue seizing opportunities to increase recognition of the role that NRC and its partners play in Canadian innovation.

NRC also stepped up its science outreach activities directed at students and teachers. After years of participating in the national Marsville event, in 2006, NRC took on the leadership role for this pan-Canadian initiative. Marsville brings elementary and intermediate students together with engineers from industry, universities and government labs, in person, through videoconferences and the Marsville blog. NRC also participated in the National Engineering Challenge and the Sanofi-Aventis Biotechnology Challenge; opened its facilities to students and visitors from St. John's to Victoria through tours and visitor centres; and shared science learning resources directly with instructors through presentations and exhibits at science teacher conferences. In addition, NRC researchers got involved by visiting classrooms to give students a sampling of their knowledge and enthusiasm for science and technology. New interactive content to foster greater interest in science and technology was added to NRC's Student Science and Tech Web site, and NRC distributed more than 212,000 print publications to students in every province, covering topics from astronomy and chemistry to biology and Canadian inventions.

HIGHLIGHTS 2006-2007

In 2006-2007, NRC made significant economic contributions to Canada through collaborative research agreements, licensing its technologies, support for industry, new companies created, community-based technology cluster initiatives, and other activities.

Economic Impact

Licence agreements show the direct flow of innovative technologies into business applications. By negotiating a licence agreement to use NRC technology, an industrial partner endorses the merit of NRC research. NRC entered into many new license agreements in 2006-2007.

Over the years, NRC has launched new companies to commercialize NRC-created technologies for which there was no identified receptor capacity in Canadian industry. The continuing success of earlier NRC spin-offs is another indicator of NRC's economic impact. For example, NRC spin-off Zelos Therapeutics, Inc., which raised one of the largest rounds of investment among Ottawa-based biotech companies in 2005, had another banner year in 2007. In February, the company announced top-line results from a Phase 2 study of its novel parathyroid hormone (PTH) analogue, Ostabolin-C™, in postmenopausal women with osteoporosis. Ostabolin-C is a proprietary PTH analogue that has demonstrated strong bone-building activity in preclinical studies and is in late stage clinical development for the treatment of osteoporosis. Ostabolin-C may become a best-in-class compound in the growing PTH market and a leading therapy for the treatment of osteoporosis.

In 2006-2007, NRC signed new formal collaborative research agreements with Canadian partners, and examples are provided in the Research Results and Strategic Collaborations section of this report. NRC also entered into international research agreements to contribute knowledge in areas for which Canada is a leader, gain access to international facilities and research networks, increase international opportunities for Canadian firms, and build new research and technology alliances.

Industry Support

The NRC Industrial Research Assistance Program is NRC's innovation and technology assistance program. It supports Canadian industry by helping small and medium-sized enterprises (SMEs) augment their own capacity to innovate and commercialize their innovations.

In 2006-2007, NRC-IRAP contributed technical expertise and funding to Canadian firms for new and continuing innovative projects. NRC-IRAP also contributed funds to SMEs, youth initiatives and organizations providing technical and research assistance to Canadian industry.

Among the many companies that have benefited from NRC-IRAP support, there are three examples of firms that demonstrated exceptional growth and successful market penetration this year, and which touch on NRC's three areas of national priority and its key sectors.

- *XSENSOR Technology Corp.* (Calgary, Alberta) – People with medical conditions who must spend their time sitting or lying down often get pressure ulcers that can lead to life-threatening infections. XSENSOR has developed a technology to minimize or eliminate this pressure, and produces a range of transducers that convert pressure readings into electrical signals that can provide continuous, real-time measurements for any surface.

Installed on the seat and back of a wheelchair, these sensors can map out all the contact points with an individual's body and identify those that exert the greatest pressure. Such information can be vital to clinicians who handle patient cushioning, bandaging, or the fit of an orthotic device. By providing the thinnest, most flexible sensors on the market, XSENSOR has positioned itself on the leading edge of innovation with a wide range of applications.

NRC-IRAP helped the company create the new technology platform by providing financial support and helping to identify and investigate technology aspects more aggressively. With this support, the company was able to take more research risk, which paid off by accelerating the development cycle of its core technology. Among its honours, XSENSOR has received the RBC Small Business of the Year award, and the Alberta Science and Technology Industrial Research Prize, and was selected as one of 20 Cool Companies in Western Canada. Today, XSENSOR products are sold in the U.S., Europe, Asia and Australia.

- *Mirus International* (Mississauga, Ontario) – Mirus competes globally in the specialty electrical transformer market, and the company's success in resolving difficult power quality problems led to a decade of growth and profitability in the 1990s. But in 2003, the electrical transformer industry experienced significant consolidation, leading to a steep decline in sales for Mirus. Determined to regain its market share, Mirus came to NRC-IRAP with a plan to develop a unique new harmonic filter for variable speed drives.

Unlike anything on the market, the filter was conceived as a tool to mitigate the harmonic frequencies introduced by electrical currents drawn by non-linear loads, such as variable speed drives. NRC-IRAP supported the development of Mirus' new Advanced Universal Harmonic Filter and convinced the company to invest in guidance to study the evolving marketplace for the new product.

Today, Mirus has successfully transformed itself and is rapidly gaining steam. Its sales jumped 62 percent in the past fiscal year and it won the 2006 Frost and Sullivan Technology Leadership Award. Mirus attributes much of its success to the funds and support it received from NRC-IRAP to improve its new device and identify new market opportunities.

- *Scanimetrics Inc.* (Edmonton, Alberta) – All the semiconductor chips in computers, cellular phones, automobiles, medical equipment and other goods must be tested before being incorporated into products. Current testing methods involve touching the chips and can easily damage circuits, significantly driving up costs. Edmonton's Scanimetrics Inc. is now using a unique “virtual probe” technology to test many circuits simultaneously without touching the chips, reducing costs by as much as 1,000 times compared to current methods.

Initially, Scanimetrics worked with the University of Alberta where the technology was developed. Then Scanimetrics began working with NRC-IRAP, receiving funding and advice to support its technology development activities. NRC-IRAP put the company in touch with expert advisors who understood the technological and market challenges, and helped Scanimetrics determine the best application of its technology in industry.

The company has conducted customer trials of its technology with two large integrated device manufacturers: one in Europe, the other in the United States. Scanimetrics also has signed an agreement with a Taiwan-based foundry, United Microelectronics Corporation, to fabricate its first product prototype. The company's continued success will advance the semiconductor industry in Canada and worldwide, and promote Alberta's growing knowledge-based economy.

World-Class Research

Every year NRC staff present leading-edge Canadian research at international conferences and publish their work in peer-reviewed publications. 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 dissemination of knowledge and the creation of value for Canada in the long term.

NRC has consistently produced more than 1,000 peer-reviewed publications each year over the last five years. In 2006-2007, NRC organized external conferences, workshops or seminars within Canada, and helped put Canadian R&D on the map by organizing or hosting international conferences and workshops, and by receiving foreign delegations.

Highly qualified experts at NRC were also invited to represent Canada and professional associations on international committees, standards-setting bodies and multi-national project teams.

Here are several examples of international collaborations in which NRC played a pivotal role:

- *Uncovering da Vinci's Mona Lisa* – 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 portrait of the *Mona Lisa*. C2RMF requested that NRC researchers travel to Paris to create a detailed three-dimensional model of the *Mona Lisa* using a sophisticated 3D laser scanner designed and built by NRC. The scanner – capable of scanning at a depth of 10 micrometres, or about one-tenth the diameter of a human hair – revealed secrets of da Vinci's unparalleled brushstroke technique and will also help to address conservation and deterioration concerns. NRC's 3D technology has a range of applications in the industrial, medical, space, forensic and entertainment sectors.
- *The Secret Life of Electrons* – A three-nation team of researchers led by NRC has captured the first direct “light signatures” of electron-like particles called composite fermions. For more than 20 years, these mysterious fractionally charged particles have been deduced from measurements of electronic current flow, but never directly observed with light – until now. NRC worked with France's Grenoble High Magnetic Field Laboratory, home to the world's second most powerful research magnet, and NTT Basic Research Laboratories in Atsugi, Japan. The research has wide-ranging potential applications from understanding the structure of matter to developing next-generation electronics, including quantum computers.
- *New Technology for Industrial Applications* – A new R&D consortium headed by Airbus UK is exploring the industrial applications of an innovative technology, developed at NRC, which may impact on the way components are formed in the aerospace and racing car industries. Laser consolidation technology is a computer-aided manufacturing technology that uses a laser beam to melt injected metallic powder to form a functional net-shape component. NRC developed this innovative method to manufacture parts and tools in a single step with high-performance materials such as high-strength steel, stainless steel, and aluminium, nickel, cobalt and titanium alloys. This technology will lead to stronger materials, greater freedom of design and faster product development cycles.
- *Kryptonite Found on Earth* – NRC and British scientists have jointly identified a new mineral matching the chemistry of the fictitious kryptonite – the mineral that could bring Superman to his knees. Like its fictional counterpart, the new mineral – found by a mining firm in Serbia – contains sodium, lithium, boron, silicate and hydroxide. But unlike the stuff of fiction, the real kryptonite is white, powdery and not radioactive. London's Natural History Museum needed help to identify it because the sample crystals were too small for traditional analytical methods. So the Museum enlisted NRC's experts to conduct sophisticated analyses of the mineral's structure, confirming that the mineral was indeed a “new borosilicate material” worthy of being documented by the *European Journal of Mineralogy*.

People Advantage

In 2006-2007, NRC attracted visiting workers to its research facilities – including postdoctoral fellows and research associates – as part of NRC's commitment to and role in preparing Canada's next generation of researchers.

NRC's highly qualified scientists also continued to garner recognition, receiving awards from external organizations. The honours and accolades ranged from being elected fellows of the Royal Society of Canada and garnering the prestigious *Killam Prize* to earning the Canadian Association of Business Incubators' *CABI President's Award* and being named *Technology Partnership of the Year* by the Ottawa Centre for Research and Innovation (OCRI).

In addition to being recognized for outstanding research, NRC employees earned praise in 2006 for best practices in official languages and diversity. NRC employees in Vancouver received a Public Service Award of Excellence for their employment equity and diversity initiatives. The Public Service Human Resources Management Agency's *Annual Report on Official Languages* commended NRC's Consultative Committee on Official Languages for its Maintenance of Second Language Skills Campaign. Activities undertaken as part of this campaign will serve as best practices for other organizations wishing to increase the language skills of employees.

In 2006-2007, NRC also reached pay equity settlements reinforcing its commitment to ensure an equitable workplace for all. In July 2006, NRC and the Research Council Employees Association reached a settlement involving employees classified as clerical and regulatory (CRs), secretarial, stenographic, and typing (STs) or administrative support (ADs) staff. In early 2007, a settlement was reached with the personnel administration (PE) group of NRC employees, and payments will be made to eligible employees by July 2007.

Technology Cluster Initiatives

Over the last several years, the Government of Canada has invested in the development and growth of NRC technology cluster initiatives across Canada. NRC continues to nurture the growth of these community-based clusters by encouraging more involvement and leadership from partners. In this role, NRC provides innovative firms with R&D expertise, research assistance and access, a collaborative environment, and opportunities for engagement with key players, regionally and nationally.

In 2006-2007, NRC completed an evaluation of six of its western and central technology cluster initiatives. Findings pointed to strong growth in these Phase II initiatives, supporting progress previously made by NRC in clusters across Atlantic Canada. To date, NRC's proven track record in spurring community-based innovation across the country has garnered almost half a billion dollars in support from the Government of Canada.

In communities across the country, NRC helped young firms succeed by providing co-location and industry partnership facility (IPF) tenants with full-service facilities. IPF tenants benefit from proximity to vibrant technology clusters; access to R&D expertise; design, testing and prototyping services; technical information and business planning services; and opportunities for research collaborations and networking.

Here are a few examples of major announcements involving NRC's technology cluster initiatives:

- *NRC Nutrisciences and Health Open for Business* – In February 2007, NRC officially opened its nutrisciences and health research facility in Charlottetown, Prince Edward Island. The \$13.5 million state-of-the-art facility creates a dynamic research and commercialization hub for the province's emerging bioresources cluster. Here, NRC scientists are working with their counterparts from Agriculture and Agri-Food Canada and researchers from the University of Prince Edward Island to see how compounds found in nature can be used to tackle critical health problems such as infection and immunity-related issues, neurological problems such as Alzheimer's and multiple sclerosis, and complications related to obesity.

Established through a cooperative funding arrangement between NRC, the Atlantic Canada Opportunities Agency, the Province of Prince Edward Island, Agriculture and Agri-Food Canada, and the University of Prince Edward Island, the facility will enable nutriscience companies in the early stages of research to benefit from the equipment and collaborative expertise offered on site. Researchers will also work with their private-industry counterparts to help turn PEI's expertise in bioresources into marketable products for disease prevention and therapy – positioning Canada to further capitalize on a global nutrition market valued at more than \$182 billion annually.

- *Public-Private Partnership for Tiniest Technology* – In February 2007, NRC entered into a nanotechnology R&D partnership involving NRC, the University of Alberta, Xerox Research Centre of Canada, and the Government of Alberta's Advanced Education and Technology program. The \$4.5-million, three-year partnership will focus on collaborative materials-based nanotechnology projects, including document and display-related technologies, in Edmonton, Alberta and Mississauga, Ontario.
- *NRC Launches BioAccess Commercialization Centre* – In November 2006, NRC officially opened its BioAccess Commercialization Centre in Saskatoon. The Centre is helping innovative firms in Western Canada's nutraceutical, functional food and natural health products industries bring products to market and stake a claim in the lucrative \$150 billion global market. At the Centre, NRC provides research expertise, business development support programs, expert business knowledge, resources and advice to help new companies survive the challenges of their developmental years. To mark the event, the Centre hosted an inaugural workshop, *BioMapping: Your Pathway to Commercialization*, bringing SMEs from across Western Canada together in Saskatoon.

- *NRC Opens Fuel Cell Research Facility* – In September 2006, NRC officially opened its new \$20 million facility in Vancouver on the University of British Columbia campus, positioning NRC at the hub of the city's expanding fuel cell and hydrogen technology cluster. NRC's research facility provides a specialized and safe research environment for scientists from NRC, other federal organizations, and collaborative industry and university partners. The 70,000 ft² facility provides an excellent platform for hydrogen and fuel cell technology demonstration activities as well as a home for the Vancouver Fuel Cell Vehicle Program and a node on the Hydrogen Highway™. Key building highlights include state-of-the-art hydrogen-safe labs, a hydrogen fueling station, and building-integrated fuel cell technologies, including ground source heat pumps and photovoltaic hydrogen production technologies.

Unique Tools for Canadian Competitiveness

In addition to its specialized facilities, NRC provides industry, universities and other research organizations with access to unique R&D tools. The following are examples of tools that were unveiled in 2006-2007:

- *NRC Houses Canada's Most Powerful Research Magnet* – In June 2006, the Government of Canada, in partnership with the University of Ottawa and the provinces of Quebec and Ontario, officially opened the \$15 million W.G. Schneider Building at NRC's Ottawa campus, home to a critical mass of five spectrometers. Canadian scientists and industry now have access to a multimillion dollar 900 MHz (21.1 Tesla) spectrometer, Canada's most powerful magnet. This unique tool will help scientists develop new battery composites, nanomaterials for electronics, plastic polymers for vehicles, glasses for more sensitive sensors and faster computer processors, new materials for hydrogen storage, as well as health-enhancing antibiotics.
- *A New Tool Supporting Advances in Health* – In March 2007, NRC acquired a MALDI-TOF/TOF mass spectrometer, a state-of-the-art technology that promises to significantly advance research in neuroglycobiology, cancer and infectious diseases. MALDI-TOF/TOF is an effective analytical tool for glycomics studies, rapid identification of microorganisms by 2D mass fingerprinting, and molecular imaging of tissues. The research-grade instrument will also support the development of chemical measurement standards and open new fields for metrology in the bio-molecular arena. It is expected to facilitate new collaborative interactions, both within NRC and with external stakeholders.
- *Nanotechnology Measurement and Calibration* – NRC has established a program for accurate measurement and calibration of nanoscale length artefacts, acquired an atomic force microscope, and developed an in-house three-dimensional stage for 3D characterization and manipulation. NRC now offers a client calibration service for grating pitch calibration using optical diffraction, which is directly traceable to the SI definition of the metre. Commercial and in-house instrumentation will complement its diffractometer capability to provide a broad spectrum of nanoscale dimensional characterization.

International Connections

NRC works continuously to increase innovation in Canada through strategic R&D alliances with other countries. International research collaborations generate greater foreign investment in Canada's economy and lead to stronger S&T networks from which Canadian researchers and companies may benefit. In addition to less formal interactions, NRC announced the following global reach activities in 2006-2007:

- *Canada-India Agreement to Advance Biotechnology Research* – In December 2006, NRC signed a Memorandum of Understanding (MoU) with India to extend scientific collaboration in biotechnology. The MoU recognizes the importance of India and Canada's research cooperation, and reaffirms the benefit of S&T in Indo-Canada relations. The priorities for this collaboration include: harnessing the properties of certain plants to improve human and animal health, and understanding and exploiting the genomics of plants of common interest to the benefit of both countries. The two nations will also jointly explore additional areas of research such as vaccine design, production and delivery systems, and biodevices.
- *Canada-China Collaborations* – In January 2007, NRC participated in a federal delegation visiting Shanghai and Beijing where Canada signed the Canada-China S&T Accord and the Joint Training Program. NRC President Dr. Pierre Coulombe is co-chair of the Canada-China Joint Committee overseeing the Accord, which focuses on areas of research that are also NRC priorities – clean, renewable energy; environmental technologies; health and life sciences; biotechnology, agri-foods and bioproducts. NRC and China's Ministry of Education signed an MoU to establish a joint training program that will involve matching Chinese and Canadian researchers in NRC labs.
- *Multinational Firm Invests in Canadian Biotechnology Research Expertise at NRC* – In February 2007, NRC signed a \$1.5 million multi-year Research Partnership Agreement with an American firm, Valent BioSciences Corporation, to conduct plant hormone research at NRC in Saskatchewan. Valent will also expand its Canadian operations by establishing its own research group at NRC, creating several jobs for highly skilled personnel in Saskatoon. The research will focus on plant hormones that affect how plants respond to stressful environmental conditions, such as seasonal weather variations, by regulating water use and plant growth. A better understanding of the effects of these plant hormones may lead to improved plant performance and plant adaptability.

S&T Information for Canada

The NRC Canada Institute for Scientific and Technical Information (NRC-CISTI) has information specialists, client services officers and technical business analysts located at NRC institutes and in technology clusters across Canada. In 2006-2007, NRC-CISTI staff in the Atlantic cluster alone performed searches for and assisted more than 2,600 clients, a 16 percent increase in the number of clients over the previous year.

For the second year in a row, the Outsell Inc. survey (May 2006) of enterprise buyers from the corporate, not-for-profit, government, education and healthcare sectors ranked NRC-CISTI top overall for document delivery. The survey measures a number of attributes that drive buyer satisfaction: depth/breadth of coverage, fair pricing, ease of doing business, and whether clients would recommend services to others. Outsell is the leading research and advisory firm providing actionable market analytics for the information industry.

To support the commercialization thrust of the new NRC Strategy, NRC-CISTI laid the groundwork to expand its competitive technical intelligence (CTI) services beyond NRC researchers, institute business development officers and senior management, to include Canadian SMEs served by the NRC Industrial Research Assistance Program. In two years, the number of NRC-CISTI professionals providing competitive technical intelligence services has grown from 2 to 10. They delivered 250 reports to clients in 2006-2007, compared to 75 in 2005-2006.

Decision makers value CTI services that assess the commercial potential of new technologies, validate market demand, identify competitors and potential partners, propose technology applications, and recommend product price. Such 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.

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. In addition, on a trial basis NRC Research Press will provide open access to articles in *Genome*, its biomedical journal, one year after publication.

RESEARCH RESULTS AND STRATEGIC COLLABORATIONS

In 2006-2007, NRC's multi-disciplinary researchers achieved leading-edge discoveries, conducted important R&D tests and struck strategic collaborations with broad-ranging potential for Canada's economy, the health and wellness of Canadians, and critical aspects of the environment and energy. Following are some examples of the important work undertaken across the country in NRC labs.

Health and Wellness of Canadians

Better Diagnosis for Prostate Cancer – NRC and the Atlantic Cancer Research Institute in Moncton, New Brunswick have developed a more accurate method for identifying prostate cancer – a disease that strikes one in seven Canadian men over their lifetime. Current prostate specific antigen screening is only 75 percent accurate for diagnosis, while the new method has a 96 percent accuracy rate. Using data from DNA microarrays to identify the genetic markers of prostate cancer in biopsy samples, the new method requires fewer tests to confirm a diagnosis, promising to reduce patient discomfort, health care costs – and ultimately mortality rates. The team has filed a patent for this technology, which has an estimated global market of US\$4.5 billion, and now plans to identify biomarkers for colon and breast cancer as well as some non-cancerous diseases. This project has contributed to the creation of the Cancer Populomix Institute, based at an NRC facility in New Brunswick.

Molecular Imaging for Better Diagnostics – NRC is working with Advanced Research Technologies Inc. to expand R&D in the emerging field of molecular imaging, which combines traditional and novel imaging techniques to non-invasively determine the anatomical location and molecular characteristics of diseases. The “molecular diagnosis” of disease will enable the selection, administration and monitoring of personalized treatments in patients. Among its applications, molecular imaging research can help identify and characterize brain-specific targets that could lead to therapies for neurodegenerative diseases that affect an aging population. Imaging-based approaches also promise to accelerate drug evaluation and shorten the time to clinical application.

Better Protection for Canada's Troops – Soldier fatalities due to the hazards of driving wheeled light armoured vehicles on Afghanistan roads led Canada's Armed Forces to decide to use tracked vehicles such as the Leopard 2 tank. However, the new Leopard tanks lacked many of the communications, situational awareness, and command-and-control systems in use by the Armed Forces. NRC played a central role in the design and integration of these systems for the Leopard 2 tanks using a virtual design environment. NRC researchers also helped to evaluate various cooling systems to combat the effects on the tank and crew of operating a 66-ton metal vehicle in desert conditions. NRC's unique facilities and expertise helped Canada meet tight timelines to ship the tanks to Afghanistan to protect soldiers' lives and improve how Canadian troops function in a threatening environment.

Crops for Enhanced Human Health – NRC has successfully engineered the *Brassica carinata* oilseed to produce higher levels of nervonic acid, a naturally occurring fatty acid suitable as a feedstock in pharmaceutical, nutraceutical and industrial applications. Nervonic acid has commercial potential in enriched infant formulas and dietary supplements to help promote optimum brain and neural development in infants and young children, and in pharmaceuticals to alleviate symptoms of Alzheimer's disease, Parkinson's disease and multiple sclerosis. This substance also has potential for use in polymers, polyurethane plastics and foams, coatings and adhesives, composite materials and cosmetic formulations.

Improving the Triage and Tracking of Disease – A project coordinated by NRC and funded by Defence Research and Development Canada has produced innovative medical software: a triage program that can turn any computer into a powerful manager of emergency medical information, and a disease-tracking system that allows public health officials to analyze vast amounts of medical data efficiently. Developed in collaboration with AMITA Corporation, Carleton University and the University of Ottawa, the Rapid Triage Management Workbench is a portable, wireless, Internet-based program for managing medical crises of practically any scale. It allows emergency responders and health personnel to create a database for monitoring multiple casualties and their status – information that can then be shared instantly with doctors in the field and institutions that await the arrival of injured parties by ambulance. The triage program promises to help reduce the chaos associated with natural and industrial disasters or terrorist attacks, and is now being marketed by AMITA internationally.

The second system, called ECADS (Early Chemical/Biological/Radiological/Nuclear Attack Detection Surveillance), was originally designed to look for syndromes associated with health threats or terrorist activities. In pilot tests, ECADS showed it could have provided an earlier warning that deadly *E. coli* bacteria had infiltrated the water supply of Walkerton, Ontario in 2000 – thus reducing the extent of illness and perhaps saving lives during this crisis. ECADS has been installed by the Grey Bruce Health Unit, which handled most of the Walkerton cases. The system could also be modified to study the occurrence and treatment of chronic ailments such as diabetes or heart disease, which are difficult to analyze using traditional medical records.

Practice for Brain Surgery – Using software being developed at NRC, surgeons-in-training will be able to rehearse delicate brain surgery before participating in real operations, much as pilots train on flight simulators before flying a plane. The software creates a 3D “virtual neurosurgery” that provides haptic – or touch – feedback that simulates the pressure of cutting into a patient with a scalpel or scissors. NRC's haptic system is being developed jointly with Montréal-based MPB Communications. Beyond teaching medical students neurosurgical skills, the system would help more experienced surgeons keep up with new surgical techniques, and could even provide hands-on instruction for surgeons working in remote communities.

Shedding Light on Building Safety – In October 2006, NRC tested a new fire safety system that uses photoluminescent material (PLM) to help occupants safely evacuate a blacked-out or smoke-filled building. PLM stores energy from natural and artificial light and becomes highly visible in darkness. For an office tower test, PLM was used in the signs on walls, floors, stairs and handrails in various stairwells of the building. During a surprise fire drill, employees were videotaped going down the stairwells to help NRC researchers measure their movement time and ability to find destinations. NRC's work in photoluminescent way guidance will help researchers to understand human behaviour in life-threatening situations and can be used to improve safety standards, codes and guidelines.

Sensing an Opportunity for Biopharmaceuticals – NRC researchers have demonstrated the first silicon photonic wire evanescent field (PWEF) sensor element. It is sensitive enough to eliminate the need for polymerase chain reaction amplification in DNA-based assays, and supports high throughput screening. The silicon-based sensor could fill a need for fluorescent label-free sensor arrays in genomics and proteomics-based diagnostics and research, as well as for drug screening in the pharmaceutical industry.

Better Oral Health – NRC scientists and their collaborators are using Raman spectroscopy and optical coherence tomography to develop a cost-effective technology to help dentists detect, prevent and possibly reverse patients' early dental decay. In 2006, the U.S. National Institutes of Health's National Institute of Dental and Craniofacial Research awarded a four-year US\$1 million grant to researchers from NRC, the University of Manitoba, Dalhousie University and Quebec's National Optics Institute to develop intra-oral probes and validate the methods for clinical use. The non-invasive technology uses non-ionizing radiation. The team believes it can help overcome the limitations of a single technique like dental x-rays, which cannot catch early lesions. The goal is to help dentists focus more often on cavity prevention and tooth preservation than restoration.

A Profitable Partnership for Producing Bacterial Protein – NRC and Sanofi Pasteur, the vaccine division of the Sanofi-Aventis Group, successfully established a strong, efficient and effective partnership to develop the processes for the scale-up, production and purification of sizable quantities of a bacterial protein. NRC not only offered Sanofi Pasteur the infrastructure, but also the scientific know-how to perform the mandate. The company's decision to partner with NRC was also based on the quality of the microbial and enzymatic technology group's integrated team, with upstream and downstream expertise and the openness of communication that established the group's credibility. One of the major outcomes of this project was the development of a high yield GLP process.

Identifying Marine Medicines – Nearly 80 percent of today's medicines were initially derived from land plants, but pharmaceutical firms are now looking for new sources. NRC and Florida Atlantic University (FAU) have teamed up to search for marine-derived pharmaceuticals. FAU has expertise in isolating natural compounds, while NRC scientists specialize in assaying naturally derived chemicals. This collaborative research will mainly focus on discovering compounds with analgesic or cancer-fighting properties, but the partners may also investigate the properties of conotoxins – powerful neurotoxins derived from the venom of marine cone snails.

Safety of Rural Mail Delivery – In 2006, postal workers in New Brunswick refused to deliver mail in rural areas, alleging an unsafe work environment. Surface transportation experts at NRC worked with Canada Post's senior management to investigate the claims of the postal workers; analyze various federal, provincial and local regulations; and develop recommendations to resolve the issue safely and productively. Working with vehicle safety experts, NRC pulled together essential elements of highway and motor traffic safety to create a new method for evaluating rural routes for postal worker and public safety. This expert knowledge helped forge an agreement between the postal union and senior management. NRC's work was instrumental in diffusing a situation that had captured the attention of rural communities across Canada, and NRC was recognized by the Prime Minister's Office for this work.

Safety at Sea – NRC continues to study how technology can help to improve the working lives of Canada's mariners. Capsizing is one of the biggest risks to fishing boats. Using physical models and numerical predictions, NRC researchers are studying the physics of capsize. This research, which is being done for Transport Canada and other clients, will be used to accurately predict vessel motions in rough waters, making it possible to develop tools for design and regulation. NRC is also looking at the potential for injury or death in various parts of a vessel from sudden jolts caused by the vessel's response to waves – research that will help to identify habitability considerations for fishing boats and develop numerical tools for predicting crew safety.

Life Raft Performance – With more than \$2 million from the National Search and Rescue Secretariat and a research consortium, NRC is studying how life rafts perform as weather deteriorates, what physical and mental demands are placed on the crew, and what type of training could increase the odds of survival. The result of this research will be better products, increased survival time, and reduced risk for search and rescue personnel. In March 2007, NRC held a workshop to share the results of the work with attendees from life raft manufacturers and users, the Canadian coast guard and research organizations. In another project, NRC researchers are studying how factors such as environment, raft occupants and the raft itself affect heat loss in order to develop tools to predict survival time for life raft occupants.

Quantum Leap in Controlling Molecules – NRC researchers have developed a new technology that uses laser pulses to control quantum processes. The method was demonstrated by using an ultra-fast laser pulse to change the outcome of a chemical reaction. Quantum technologies aim to manipulate matter at the molecular scale in ways not usually seen in nature. This new technology has possible implications for quantum computers, which are the subject of an international race. Other possible applications are new forms of optical microscopy of live cells, in which quantum methods could be used to sharpen images, enhance microscope sensitivity, and even perform molecular-scale surgery on individual cells.

Environment-related Research

Laser Sensors to Analyze the Atmosphere – Practical, portable laser spectrometers require a laser diode light source. NRC has developed an antimonide-based laser diode – a breakthrough that could accelerate the development of mid-infrared sensor technology to revolutionize laser gas analysis. The combination of laser diode technology with high-sensitivity detection techniques enables the highly selective and sensitive measurement of trace gases that are important for atmospheric and combustion research, and environmental and chemical process monitoring.

Clouds Sampled to Determine Influence in Climate Change – In the winter of 2006-2007, NRC and Environment Canada conducted a major international satellite remote-sensing validation project to increase understanding of the impact of clouds on climate change. Funded by the Canadian Space Agency, the Canadian CloudSat/CALIPSO Validation Project involved two satellites launched in April 2006 – CloudSat and CALIPSO – that are conducting the first-ever comprehensive three-dimensional study of clouds and aerosols. To validate the measurements and develop algorithms for determining the properties that can be fed into weather and climate models, researchers used instrumentation on NRC's Convair-580 aircraft to sample clouds beneath CloudSat as it passed overhead. This project used the aircraft's newly installed dual-wavelength radar system, the most advanced in the world, to measure cloud properties. Given that even small changes in cloud cover and cloud optical properties can significantly alter climate, the information gained from the study will be invaluable in helping researchers understand the effects of clouds on the climate.

Harmful UV Sheds Clue to Early Survival on Earth – NRC scientists have gained new insight into how DNA deals with harmful ultraviolet (UV) radiation. Their findings shed new light on how molecules use ultrafast mechanisms to protect themselves against UV damage. These studies have implications for how early life was able to sustain itself on Earth without the protective ozone layer. Researchers developed a comprehensive model explaining how the constituents of DNA use ultrafast mechanisms to quickly convert UV light into heat. These mechanisms operate on picosecond (a millionth of a millionth of a second) timescales, far faster than any biological function. Understanding how to protect molecules from light-induced damage could provide important perspectives for the design of new nanoscale molecular devices, in which molecules themselves are being proposed as light-activated “nanoscale” switches or modulators.

Profiling Plant Hormones – NRC has developed a powerful new tool called plant hormone profiling to help researchers around the world identify the signaling molecules that regulate plant growth and development. NRC currently analyzes several thousand tissue samples each year for universities, research institutes and corporations in Canada and abroad. Hormone profiling has been used to study a broad range of agricultural and forestry issues such as drought tolerance in corn, fruit ripening, canola oil seed maturation, and pine seed development. In addition, NRC now synthesizes and sells plant hormone analogs for use as mass spectrometry standards.

Examining a Cold Threat – Climate change could create greater hazards for shipping in the Canadian Arctic. In research projects funded by Transport Canada and the Program for Energy Research and Development, NRC analyzed conditions at seven points along the Northwest Passage and equipped two ice floes with satellite tracking beacons (provided by the Canadian Ice Service) to measure the thickness and strength of multi-year ice.

The results showed that the decrease in annual ice cover that might be expected from global warming could potentially lead to a passage clogged with multi-year ice. The research information could be used to assist Transport Canada in updating Canada's Arctic Shipping Regulations, and help the Canadian Ice Service forecast the trajectory of multi-year ice and whether it poses a threat to ships. Reliable ice data is especially important to forecast ice conditions like those that trapped more than 100 fishing vessels off Newfoundland for several weeks in 2007.

Cleaning Up with Biostimulation – A bioremediation system has been developed by NRC in collaboration with the National Defence's Directorate of Environmental Protection, CFB-Trenton, CEMRS and Terrapex Environmental Ltd. In an efficient and cost-effective manner, this technology addresses the treatment of sites contaminated with high concentrations of 1,1,1-trichloroethane (1,1,1-TCA), a solvent used as a degreaser. It uses indigenous populations of *Dehalococcoides*, a dehalogenating bacterium capable of completely degrading 1,1,1-TCA. The technical innovations included: the identification of appropriate anaerobic conditions ensuring optimal biostimulation and biodegradation; the design of a nutrient injection and pumping system to circulate the groundwater; and the development of monitoring tools. Several months of system operation at the Canadian Forces Base-Trenton have demonstrated efficacy to reduce contaminants from 40,000 parts per billion (ppb) to 200 ppb, the accepted non-toxic concentration level. In 2006, this project won the first award given for technical innovation at the Federal Contaminated Sites Workshop and has generated \$260,000 in revenues for NRC. The technology is now being transferred to a Canadian company.

Certifying Canadian Satellite for Launch – In February 2007, NRC completed an acoustic qualification test on RADARSAT-2, a Canadian remote-sensing satellite, which is scheduled for launch into orbit later this year. The test verified that RADARSAT-2 can withstand the noise environment generated by rocket engines during launch, including the first 60 seconds – the worst structural environment that the spacecraft will encounter. NRC has the only Canadian reverberant acoustic chamber facility capable of performing such tests. Developed by MacDonald Dettwiler and the Canadian Space Agency, RADARSAT-2 will provide the most advanced commercially available C-band radar imagery in the world for applications such as ice and coastal monitoring, land use and resource management, cartography and disaster response.

Building on Canada's Bio-strengths – A tool developed by NRC in collaboration with federal partners and Five Winds International, and with support from the Canadian Biomass Innovation Network, could represent a significant competitive advantage for Canadian companies. The Sustainability Assessment Framework and Toolkit V2 (SAFT) is a framework for developing a “sustainability profile” of new and emerging bio-based technologies based on environmental, economic and social criteria. The tool could help Canadian firms manage the risk of developing new technologies and improve commercialization outcomes.

Energy-related Research

Showcasing Canada's Alternative Energy Technologies – Canadian fuel cell products are available in the global marketplace in forklifts, transit buses, power supplies for the telecommunications sector, and other niche applications. To commercialize Canadian technologies for mass markets, greater efforts are needed to demonstrate, test and promote our industry's capabilities and expertise. This is the role of the Hydrogen and Fuel Cell Gateway, a technology demonstration and exhibit centre located at NRC's facility in Vancouver. The Gateway is a public-private partnership between NRC, Natural Resources Canada, Industry Canada, the Government of British Columbia, and Hydrogen & Fuel Cells Canada – a national industry association. The Gateway aims to increase visibility, international sales and strategic research collaborations for Canada's hydrogen and fuel cell sector. It features static and video displays, along with commercially available hydrogen and fuel cell technologies.

Collaborating to Advance Fuel Cell Science – NRC is creating research consortia focused on fuel cell science to address fundamental areas that could facilitate commercialization – including fuel cell contaminants, which affect fuel cell durability and reliability. The Contaminants Consortium is investigating the impacts of airside feed stream contaminants on fuel cell performance, and developing models to predict fuel cell performance under the influence of contaminants. This consortium has generated strong interest from Canadian industry, with two of Canada's largest fuel cell companies already participating.

Predicting Dangers to Offshore Oil and Gas Platforms – A unique computational model for more accurately predicting the path of icebergs is helping Canada's offshore oil and gas industry stay out of harm's way. The iceberg drift forecasting tool was developed by NRC in partnership with McGill University and the Canadian Ice Services. Canada's three producing oil rigs on the Grand Banks – Hibernia, Terra Nova and White Rose – all sit in the path of icebergs calved mainly from glaciers on Greenland's west coast. NRC's new model mathematically simulates the factors that can affect an iceberg's drift, such as iceberg size, wind and currents. The first Canadian technology of its kind, the tool can incorporate complex ocean currents in its calculations and is at least 30 percent more accurate than existing models.

Reliable Ocean Technology – Evaluating the performance of technology in the marine environment is of commercial value to ocean industries and helps to protect people, assets and the ocean environment. In 2006-2007, NRC evaluated the performance of ships, components for offshore oil and gas operations, energy efficient propellers, systems for harvesting renewable ocean energy, and yacht hulls for three countries competing in the 2007 America's Cup. This research was carried out for a range of industry and government clients such as the Canadian Coast Guard, the Canadian Navy, Transport Canada, Memorial University of Newfoundland, and Oceanic Consulting Corporation. NRC's physical and numerical modelling of wind, wave and current forces gives Canada a unique resource for competing in the world market, and its expertise in design optimization is critical in an era of concern for energy costs, marine pollution and greenhouse gas emissions.

Measuring the Sun's Energy Output – An NRC astronomy researcher, working with colleagues at Université de Montréal and University of Saskatchewan, has demonstrated a connection between the Sun's output at radio wavelengths and its total energy output. Based on a 60-year record of measurements made by NRC (recently in partnership with the Canadian Space Agency), the team has shown that the Sun's output has increased by about 0.2 percent since 1650 CE. This work is highly relevant to the issue of global warming because an increase in the energy the Sun delivers to the Earth's environment will add to the warming caused by human activities. Because this will influence future estimates of the Earth's warming trend, it should be incorporated into the models used for projecting future temperatures on Earth.

Documenting the Faintest Hydrogen-Burning Stars Ever – Using the Hubble Space Telescope, a University of British Columbia astronomer and NRC scientists have located and photographed the faintest stars ever seen. The astronomers estimated that the cluster was formed roughly 12 billion years ago, about 1.5 billion years after the universe was formed in the Big Bang. This discovery, published in *Science* and selected by NSERC for its inaugural list of top 50 discoveries, provides a critical check for stellar evolutionary theory of the faintest stars. It also demonstrates that the Hubble Space Telescope is capable of detecting the faintest hydrogen-burning stars in globular clusters.

THE WAY FORWARD: FROM VISION TO ACTION

This past year has seen NRC take the first steps in implementing its five-year business strategy, *Science at Work for Canada, 2007-2011*. NRC has attained two of its strategic goals for 2007 by launching its first national R&D program and announcing the industry sectors where NRC will intensify its R&D efforts. As the next few months unfold, NRC will announce more developments that will further align the organization to its new strategic orientation and the newly released Federal S&T Strategy, *Mobilizing Science and Technology to Canada's Advantage*.

NRC will continue delivering the programs and activities that have proven effective in generating economic and social benefits and improving the global competitiveness of Canadian firms. Providing technology and advice to SMEs; forging research partnerships with Canadian companies, universities and international R&D organizations; and transferring NRC technologies to industry – these are just a few of the ways in which NRC helps Canadian companies innovate and successfully commercialize new products and services.

Our many R&D accomplishments this year demonstrate the value of NRC as Canada's leading federally funded research organization. The organization's capacity to work hand in hand with industry partners through formal research partnerships and various industry support programs continues to be the hallmark of NRC's success.

In the coming year, NRC will continue focusing on national R&D initiatives that will increase the critical mass of expertise working on issues of top concern to Canadians. With the right capabilities and resources to do the job, NRC will deliver on its promise – a promise made to industry, government and all Canadians – to be *Science at Work for Canada*.



Dr. Pierre Coulombe
President

Financial Statements



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

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**

<i>(in thousands of dollars)</i>	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
	<u>242,562</u>	<u>214,537</u>
Non-Financial Assets		
Prepaid expenses	12,750	5,470
Inventory for consumption	2,111	2,216
Capital assets (Note 7)	601,363	543,824
	<u>616,224</u>	<u>551,510</u>
TOTAL ASSETS	<u>858,786</u>	<u>766,047</u>
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
	<u>314,566</u>	<u>258,820</u>
Equity of Canada	544,220	507,227
TOTAL LIABILITIES AND EQUITY OF CANADA	<u>858,786</u>	<u>766,047</u>

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**

<i>(in thousands of dollars)</i>	2007	2006
Expenses (Note 13)		
Research and development	600,627	566,534
Technology and Industry support	246,028	266,296
	<u>846,655</u>	<u>832,830</u>
Revenues (Note 14)		
Research and development	109,621	96,363
Technology and Industry support	60,536	63,503
	<u>170,157</u>	<u>159,866</u>
Net Cost of Operations	<u>676,498</u>	<u>672,964</u>

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**

<i>(in thousands of dollars)</i>	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	<u>544,220</u>	<u>507,227</u>

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**

<i>(in thousands of dollars)</i>	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	<u>550,792</u>	<u>552,115</u>
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	<u>104,845</u>	<u>73,651</u>
Investing Activities		
Proceeds from sale of equity investments	(632)	(1,683)
Cash used by investing activities	<u>(632)</u>	<u>(1,683)</u>
Financing Activities		
Net cash provided by Government of Canada (Note 3)	<u>(655,005)</u>	<u>(624,083)</u>

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

National Research Council of Canada**Notes to Financial Statements**

Year ended March 31, 2007

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

<i>(in thousands of dollars)</i>	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

<i>(in thousands of dollars)</i>	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 <i>National Research Council Act</i>	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

<i>(in thousands of dollars)</i>	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

<i>(in thousands of dollars)</i>	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.

<i>(in thousands of dollars)</i>	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)

Capital asset class	Cost				Accumulated amortization				2007 Net book value	2006 Net book value
	Opening balance	Acquisitions	Transfers, disposals and write-offs	Closing balance	Opening balance	Amortization	Disposals and write-offs	Closing balance		
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 occurred in 2007 and these proceeds were recognized in 2007.

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

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

8. Accounts Payable and Accrued Liabilities

<i>(in thousands of dollars)</i>	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

<i>(in thousands of dollars)</i>	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:

<i>(in thousands of dollars)</i>	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:

<i>(in thousands of dollars)</i>	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:

<i>(in thousands of dollars)</i>	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

<i>(in thousands of dollars)</i>	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

<i>(in thousands of dollars)</i>	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
	<u>86,228</u>	<u>76,972</u>
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:

<i>(in thousands of dollars)</i>	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.

Financial Statement Discussion and Analysis

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 will be 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 these 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.

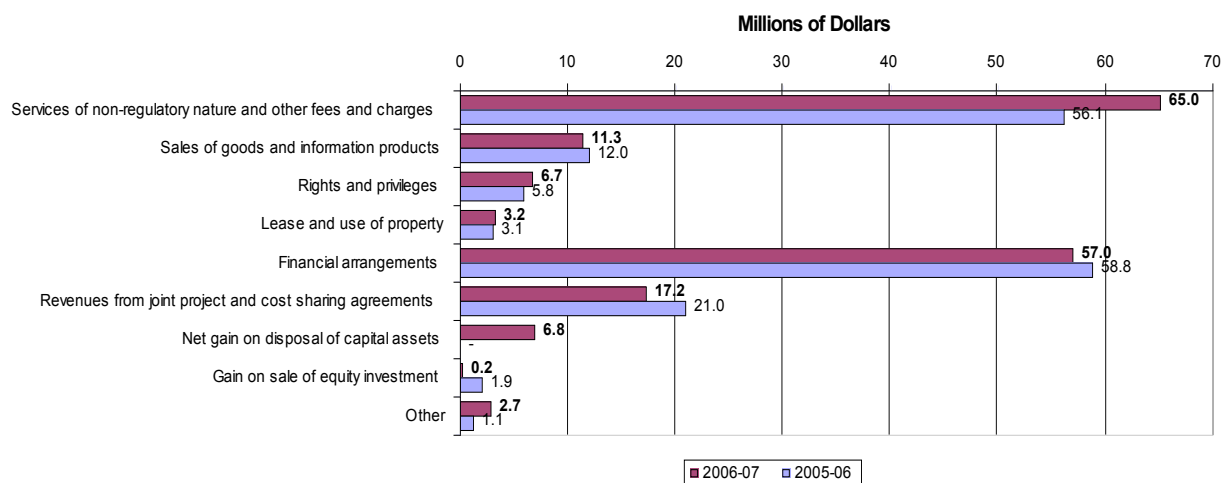
Revenue

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

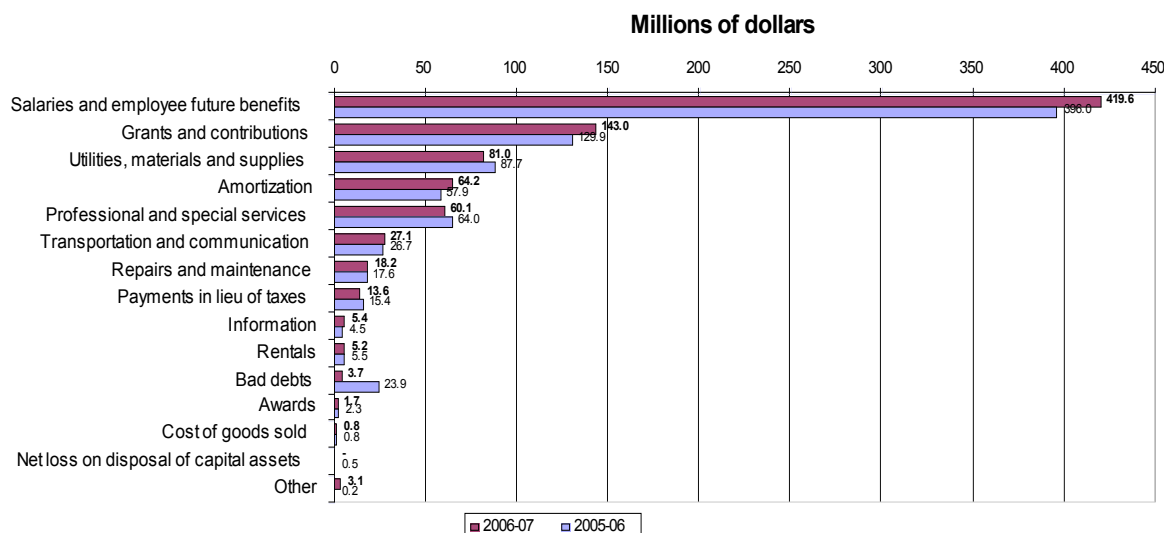
NRC's expenses in 2006-07 were \$846.7 million, compared to \$832.8 million in 2005-06, which represents an increase of 1.7%. Of this, approximately 49.6% represented salary and benefits costs, compared with 47.5% in 2005-06. Grants and contributions costs totaled \$143 million in 2006-07, with most 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 sunseting 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
○ New invoices	14.2	35.6
○ Payments received	(8.5)	(11.4)
○ Write-offs	(2.6)	(17.6)
Balance, end of year	10.7	7.6

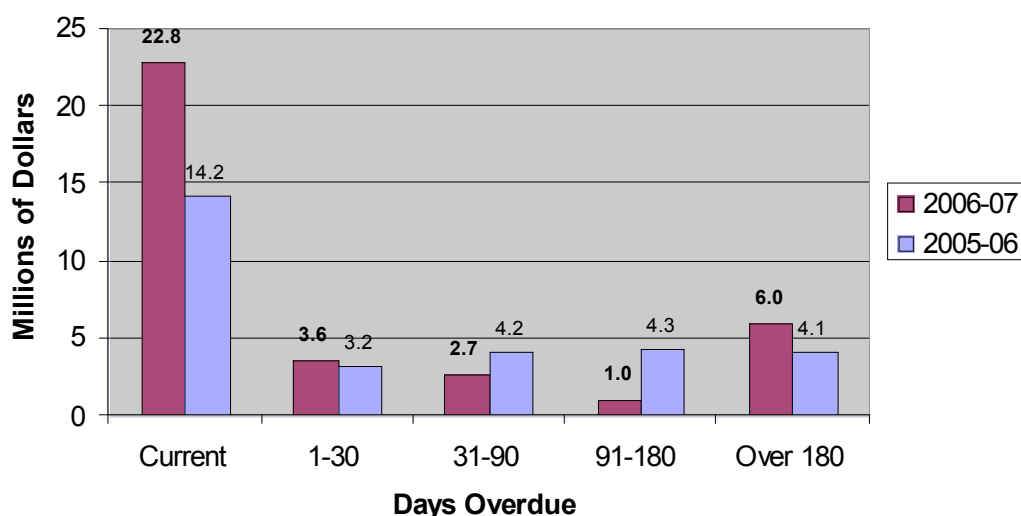
In 2006-07, NRC continued to assess all active contribution agreements to determine if the repayment phase conditions had been met. This major initiative had started during 2005-06 when substantial IRAP-TPC amounts were written off as they represented the value of the debt relating to firms that had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

Governance

NRC COUNCIL MEMBERS

As of 31 March 2007

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Mr. Louis Brunel ²	President International Telecommunications Institute Montréal, Quebec
Mr. Paul Clark	Former Chief Executive Officer NOVA Research and Technology Corporation Calgary, Alberta
Dr. Pierre Coulombe	President (and Chair of Council) National Research Council Canada
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Dr. Peter Frise	Professor Automotive Research and Studies University of Windsor Windsor, Ontario
Mr. James Hatton ¹	Lawyer Farris, Vaughan, Wills & Murphy Vancouver, British Columbia
Ms. Margaret Lefebvre	Executive Director Canadian Association of Income Funds Montréal, Quebec
Dr. Gilles Patry ³	Rector University of Ottawa Ottawa, Ontario
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Dr. Katherine Schultz ^{1,2}	Vice-President, Research & Development University of Prince Edward Island Charlottetown, Prince Edward Island
Ms. Barbara Stanley ^{1,2}	President BESCO Holdings 2002 Inc. Rothesay, New Brunswick
Dr. Howard Tennant ^{1,3}	President Emeritus University of Lethbridge Lethbridge, Alberta

¹ Member, Executive Committee² Member, Human Resources Committee³ Member, Audit Committee

NRC EXECUTIVE OFFICERS

As of 31 March 2007

Pierre Coulombe

President
613-993-2024

Roman Szumski

Vice-President
Life Sciences
613-993-9244

Sherif Barakat

Vice-President
Engineering
613-949-5955

Don Di Salle

Vice-President
Corporate Services
613-993-0361

Jayne Hinchliff-Milne

Director
Internal Audit
613-949-7689

Marielle Piché

Secretary General
613-998-4579

Richard Normandin

Vice-President
Physical Sciences
613-993-4449

Patricia Mortimer

Vice-President
Technology and Industry Support
613-998-3664

Daniel Gosselin

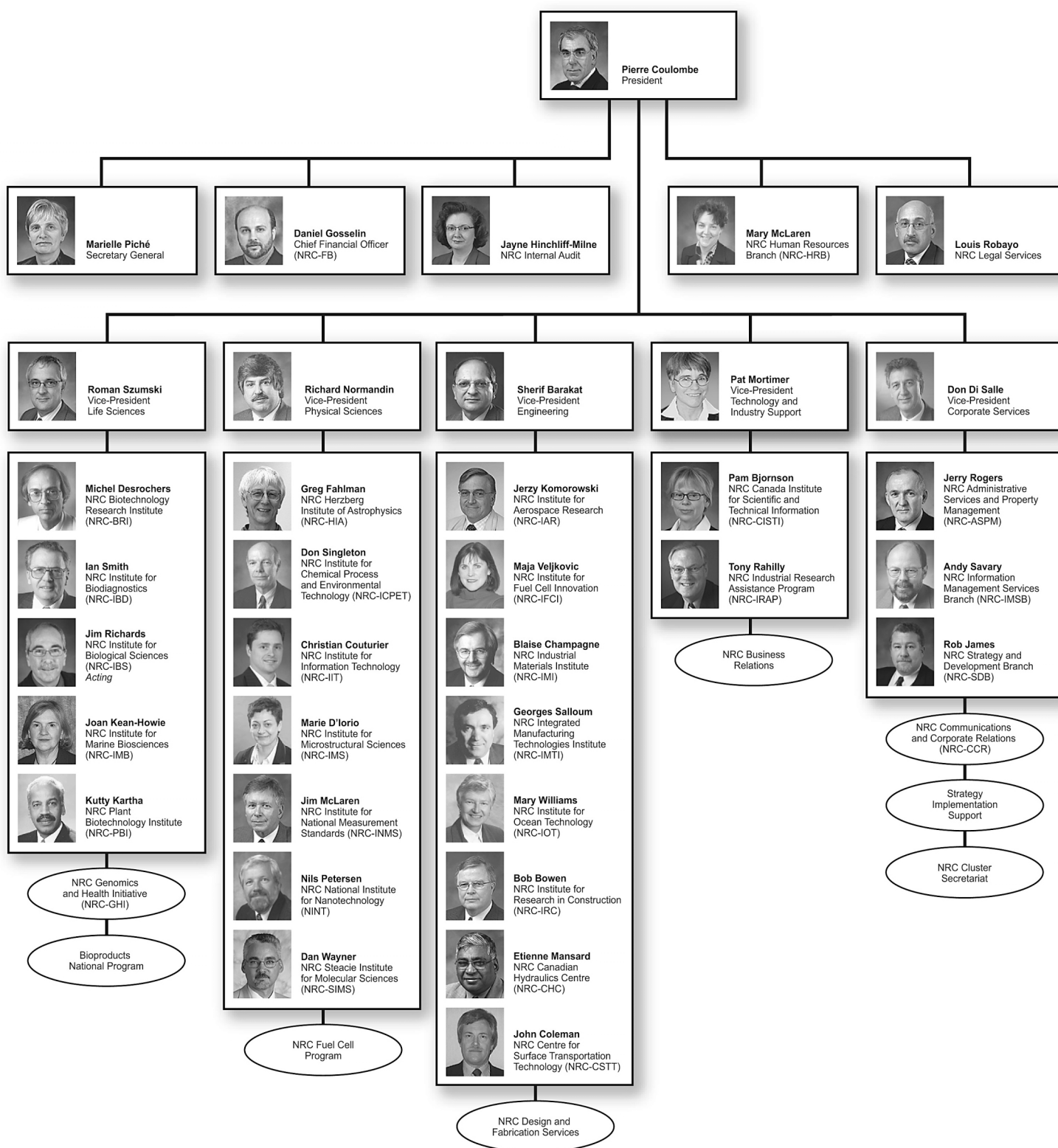
Chief Financial Officer
Finance Branch
613-990-7471

Mary McLaren

Director General
Human Resources
613-993-9391

Organizational Chart

ORGANIZATIONAL CHART



**NRC Research Institutes,
Programs and Technology Centres**

NRC RESEARCH INSTITUTES, PROGRAMS AND TECHNOLOGY CENTRES

NRC Biotechnology Research Institute (NRC-BRI)

Montréal 514-496-6100

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

Canada and U.S. Toll Free 1-800-668-1222

Outside North America 613-998-8544

NRC Canadian Hydraulics Centre (NRC-CHC)

Ottawa 613-993-9381

NRC Centre for Surface Transportation Technology (NRC-CSTT)

Ottawa 613-998-9639

NRC Herzberg Institute of Astrophysics (NRC-HIA)

Victoria 250-363-0001

Penticton 250-493-2277

NRC Industrial Materials Institute (NRC-IMI)

Boucherville 450-641-5000

Saguenay 418-545-5545

NRC Industrial Research Assistance Program (NRC-IRAP)

Toll Free 1-877-994-4727

NRC Institute for Aerospace Research (NRC-IAR)

Ottawa 613-991-5738

Montréal 514-283-9408

NRC Institute for Biodiagnostics (NRC-IBD)

Winnipeg 204-983-7692

Calgary 403-221-3221

Halifax 902-473-1850

NRC Institute for Biological Sciences (NRC-IBS)

Ottawa 613-993-5812

NRC Institute for Chemical Process and Environmental Technology (NRC-ICPET)

Ottawa 613-993-6570

NRC Institute for Fuel Cell Innovation (NRC-IFCI)

Vancouver 604-221-3000

NRC Institute for Information Technology (NRC-IIT)

Fredericton 506-444-0544

Gatineau 819-934-2602

Moncton 506-861-0950

Ottawa 613-993-3320

Saint John 506-635-0622

NRC Institute for Marine Biosciences (NRC-IMB)

Halifax 902-426-6095

Charlottetown 902-566-7465 – NRC Institute for Nutrisciences and Health (NRC-INH)

NRC Institute for Microstructural Sciences (NRC-IMS)

Ottawa 613-993-4583

NRC Institute for National Measurement Standards (NRC-INMS)

Ottawa 613-993-7666

NRC Institute for Ocean Technology (NRC-IOT)

St. John's 709-772-4939, 709-772-6001

NRC Institute for Research in Construction (NRC-IRC)

Ottawa 613-993-2607

Regina 306-780-3208

NRC Integrated Manufacturing Technologies Institute (NRC-IMTI)

London 519-430-7079

NRC Plant Biotechnology Institute (NRC-PBI)

Saskatoon 306-975-5571

NRC Steacie Institute for Molecular Sciences (NRC-SIMS)

Ottawa 613-991-5419

Chalk River 613-584-3311, ext. 6274

NRC National Institute for Nanotechnology (NINT)

Edmonton 780-641-1600

National Research Council Canada

General Information

Toll free 1-877-672-2672

TTY 613-949-3042

www.nrc-cnrc.gc.ca

info@nrc-cnrc.gc.ca