

SECTION 2: ITER CANADA PLAN TO HOST ITER

INTRODUCTION

2.1 EVENTS LEADING TO THE ITER CANADA PLAN TO HOST ITER

As a follow-up to discussions at the European Union – Canada Summit meeting held on December 16, 1999, Iter Canada prepared and issued an Expression of Interest (<http://www.itercanada.com/iter/host/interest.cfm>) and capability to host Iter. Following detailed analysis of this Expression of Interest, Iter Parties was encouraged by the Iter Parties to prepare this Plan to host Iter in Canada.

Iter Canada's preparation of this Plan has been supported by a combination of financial and technical support from the federal, provincial and local governments, corporations, universities and unions.

2.2 THE IMPORTANCE OF ITER BEING BUILT

The purpose of the Iter project is to take the next major step before building a fusion demonstration power plant as illustrated in Figure 2.1 below.

The way toward fusion power

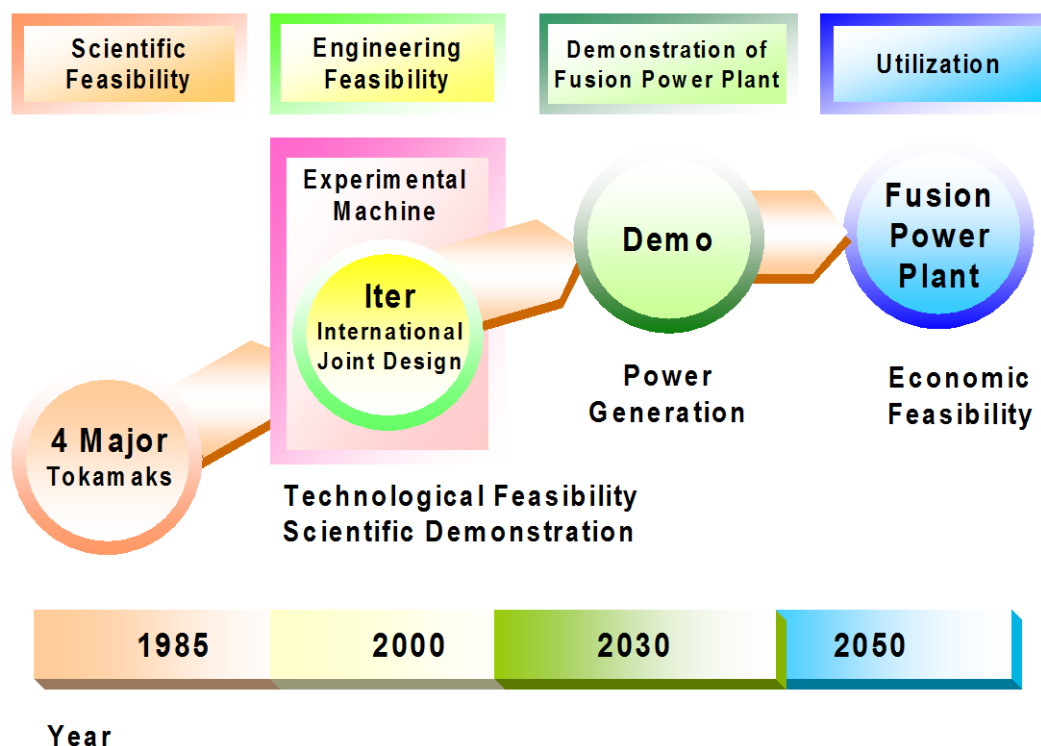


Figure 2.1: Fusion Energy Development

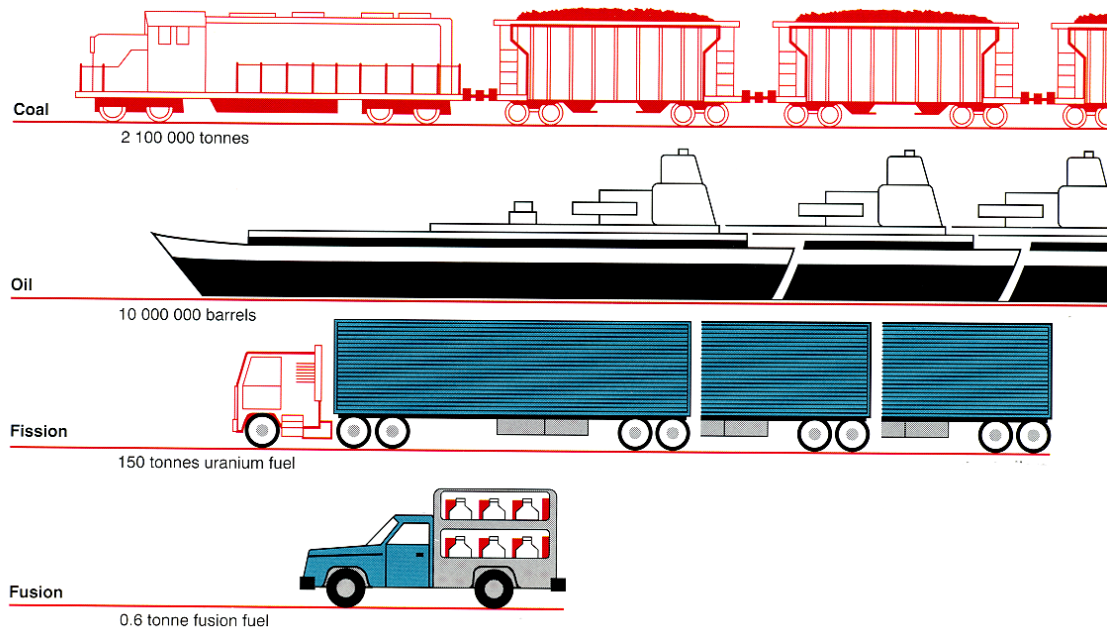
Fusion has the long-term potential to provide the world with virtually unlimited, safe, clean and sustainable energy in the future.

Based on current trends, world energy consumption is expected to increase by 50-60 per cent by the year 2010, and to continue to grow thereafter due to increased electrification, urbanization, industrialization and population growth. Currently, only 19 per cent of the world's electricity is provided by hydraulic generation, and 3 per cent by other renewable technologies, which are classed as "environment friendly," while the majority comes from fossil fuels (60 per cent) and from nuclear fission (18 percent).

Additional energy supply is needed in the 21st century to provide for the growth in demand as well as for the replacement of aging generation facilities, in particular those based on fossil fuels. All energy options must be considered and development undertaken where needed.

Fusion energy development has now reached the stage where energy output equals energy input, ie. at "breakeven". With continued development, of which Iter is an integral part, fusion could become an energy option in this century. Fusion power generation would not generate green house gases. In addition, fusion fuels are widely abundant and have a high energy content. This is illustrated in Figure 2.2 below, for a variety of energy sources, by comparing the annual fuel required to provide electricity (1000MW) for a population of 500,000.

Figure 2.2: Graphic showing comparative fuel use for 1000MW of generation for a year



2.3 THE IMPORTANCE OF AN EARLY ITER SITE DECISION

2.3.1 Iter Will Demonstrate the Potential of Fusion Energy: Fusion energy has long held great promise. But the long time taken to develop the technology has resulted in overstated expectations not being realized. As a result, despite large budgets devoted to the science underlying fusion around the world, world energy bodies do not take the prospect of fusion energy seriously. This situation poses a threat to fusion budgets because practical application is not in sight.

It is Iter Canada's belief that the implementation of Iter will change this perception. While JT-60 in Japan, and JET in the EU have demonstrated equivalent energy breakeven, Iter will for the first time produce up to ten times energy magnification, thereby demonstrating that fusion can be a major energy source. To maintain funding within the current Iter Parties, fusion must be clearly seen as a future energy form. While fusion technologies other than the tokamak may eventually emerge as economically attractive, the tokamak is by far the most advanced technology today. Therefore, the Iter Parties should proceed expeditiously with Iter implementation to successfully demonstrate fusion's potential as an energy form.

2.3.2. Important Events Before Iter Construction Can Begin: A series of important events must occur before Iter construction can begin.

- Completion of the design
- Evidence of licensability
- **Selection of host site**
- Site specific design
- Agreement on cost sharing arrangements
- Approval of budgets
- Finalizing financing arrangements
- Signing of Joint Implementation Agreement (ie. the decision to construct)
- Licensing completion
- Start of procurement
- Start of site preparation and construction

2.3.3. Site Selection is Now the Most Urgent Decision: Iter Canada believes that selection of the host site is a key short term priority for the realization of Iter. Once that is done, it establishes a known framework that enables all other activities to be carried out in a logical order and decisions to be expedited:

- **Site specific design** can be carried out with all available design resources thereby conserving resources and funds currently being applied to generic studies;
- **Formal site specific licensing activity** can proceed to completion once the site is decided, so that the construction activity can begin as soon as possible after signing of the Joint Implementation Agreement;
- **Cost sharing arrangements** can be decided since the full life cycle costs which are heavily site dependent could now be defined, and responsibilities and budgets of each Party can be established for the **approval of budgets** in a timely fashion;
- The **legal framework** and its applicability can be established with clarity; and
- **Procurement and the start of construction** can begin with a minimum of delay following the approvals of budgets and signing of the Joint Implementation Agreement.
- Productive Iter implementation work could proceed with the designation of a preferred site, such that actual construction could start much earlier than anticipated in the draft Iter Final Design Report. This includes advanced procurement and site specific technical activities.

An early site decision would be the strongest sign to the United States that the Iter decision process is working well. Also, the time of construction can be indicated with some certainty, thereby Iter Canada believes increases the possibility of the return of the United States.

2.4 THE IMPORTANCE OF THE ITER SITE LOCATION

Iter is a very large and significant undertaking that will make large demands of the host and require broad public acceptance and support. Conditions in the host country could strongly affect the conduct of the project and influence the degree of success attained, and ultimately the successful commercialization of fusion energy.

For example, obtaining regulatory approvals for Iter will be precedent setting in any potential host country. The adaptability of the potential host's regulatory process to deal with a new technology will determine the level of confidence with which Iter can be licensed in a timely and predictable manner. At the time of the negotiations on siting, the procedures to follow in order to license construction and operation of the facility should be put in place. At the time of the adoption of the Joint Implementation Agreement governing Iter, confirmation should be given that Iter

can be licensed in the host country (and that the licensing process would not be unduly vulnerable to challenge).

Long term political stability will also be important for Iter, since the project will require ~33 years including construction, operations and de-activation activities, and will continue for a further 60 to 100 years before decommissioning is completed. Therefore, the host should be in a geopolitical region of high stability and low risk.

United States officials have indicated to Iter Canada that the United States withdrawal was in part influenced by the fact that the Iter Parties did not choose a site and make a construction decision. An early site decision - late-2001 - could help bring the United States back into the project, especially if Iter was sited in Canada due to:

- ❑ the close proximity to the US
- ❑ lower overall program costs
- ❑ advanced schedule to construction completion
- ❑ advanced licensing activities
- ❑ strong public support
- ❑ participation in the initial negotiations.

The overall cost, cost shares and potential interruptions of the project will affect the willingness of governments to approve their participation. Project cost and risk are influenced by a number of factors that are strongly site dependent. Canada's Clarington site rates very favorably in all of the factors including:

- A legal system with the flexibility to allow the establishment of an Iter Legal Entity that permits the sharing of control and benefits;
- Low cost of labour, materials and energy;
- Favourable seismic conditions;
- Public acceptance of the project;
- Established procedures for shipping of radioactive substances; and
- Attractive Socio-economic / cultural / environmental conditions and a high quality of life for visiting scientists and their families.

2.5 HISTORY OF FUSION IN CANADA

The primary motive for the joint implementation of Iter by the Iter Parties, and the member organizations of Iter Canada, is the desire to progress toward the establishment of fusion as a future sustainable energy source. Because of the scale and complexity of the project, the pooling of resources and provision of special capabilities by all the participants are essential to its success.

Over the years and on an ongoing basis, Canadian universities, research centres and corporations have and are continuing to develop and maintain expertise both in

fusion physics and fusion technology. Canada has built and operated several small and a medium sized tokamak, and has established specialized laboratories for studying tritium first wall interactions, as well as tritium handling, separation and storage. The work has certainly contributed an appropriate share of innovation to the world fusion program.

Plasma physics and materials interactions research continues at the Université du Québec – *l'Institut national de recherches scientifiques (INRS)*, University of Saskatchewan and University of Toronto, funded by the Natural Sciences and Engineering Research Council of Canada. International collaboration continues in the form of exchanges of staff, components and instrumentation. International interactions also continue through participation in conferences, focussed workshops, and advisory group meetings. Benefiting from past programs and continuing through university and Iter Canada programs, a significant cadre of both young and mature scientists and engineers has been established and maintained. Ongoing student interest and enrolment continues to help position Canada to educate and train the scientists and engineers that are needed for the design, construction and operation of Iter.

In Canada, fusion development activities have uniquely been sponsored and undertaken by numerous organizations and agencies, including the major utilities, governments at both the federal and provincial level, and with the strong presence of industry and universities. This past history, the availability of developed sites, and access to existing infrastructure and tritium, position Canada to play a significant role as the host, thereby facilitating the implementation of Iter.

2.5.1 Canada has Contributed its Share to Iter Since the Beginning: Canada's contribution to Iter began in 1988 through the European Union. Chart 2-A below indicates the evolution, structure and support of the Canadian effort. The contribution by Canadian organizations has been in proportion to Canada's GDP when compared with that of Europe (approximately 7 per cent) or about Cdn \$5 million per annum. Consequently, since 1988, Canadians have contributed a total of approximately Cdn \$70 million of in-kind R&D and design effort in support of Iter and fusion technology.

Chart 2-A also illustrates the evolution of fusion activities in Canada and the growing momentum that has developed through the close cooperation of many sectors and organizations having a common interest in a Canadian site for Iter. This evolution led to the establishment of Iter Canada.

Chart 2-A: Evolution of fusion effort in Canada

Time	1982-1997	1995-1997	1997-2002
Organization	Canadian Fusion Fuels Technology Project, Centre canadien de fusion magnétique	Canada's Iter Siting Board	Iter Canada
Participants	Government of Canada Government of Ontario Ontario Hydro Hydro Québec INRS 20 private companies	Government of Ontario Ontario Hydro 2 local governments 2 unions 4 industry associations 9 private companies	Government of Canada Government of Ontario Ontario Power Generation 2 local governments 3 national labour unions 13 private companies 4 universities/ societies
Focus	R&D Iter technical support	Evaluate support for hosting Iter	Iter technical support Plan preparation Plan promotion

2.6 ITER CANADA

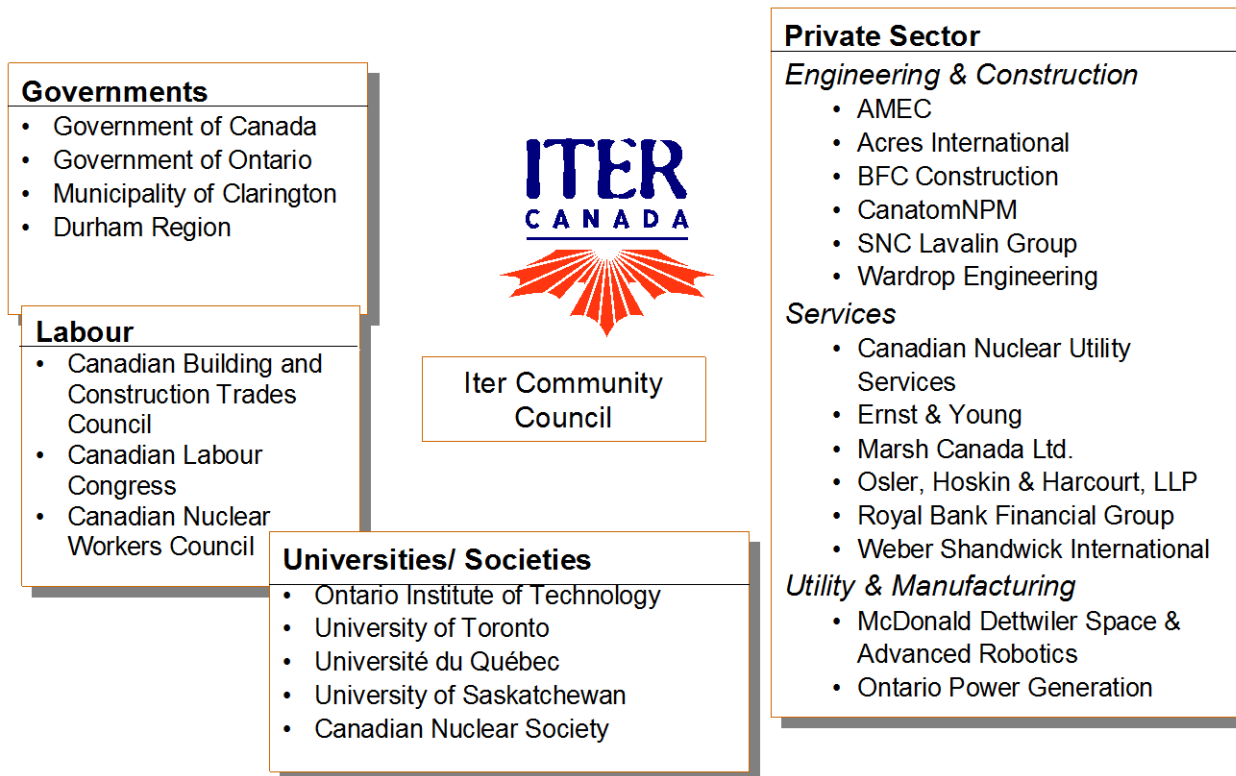
Iter Canada was incorporated in December 1997 as a not-for-profit, non-share capital federally incorporated company. Financial support to date has come from funding by the Government of Canada, the Province of Ontario and Ontario Power Generation, as well as significant in-kind contributions from all of our members.

Figure 2.3 shows the Member organizations of Iter Canada. Attachment 2-A gives information on the experience and capabilities of a number of these world-class organizations. As will be described in this Plan, many of these companies will be making major contributions to the execution of the siting of Iter in Canada. For example, this includes the six companies, (Acres, AMEC, BFC Construction, CanatomNPM, SNC-Lavalin and Wardrop Engineering), that make up the Iter Canada Engineering and Construction Consortium, the group with the prime responsibility to engineer, project manage and construct the site infrastructure, buildings and tokamak assembly as described fully in Section 5 and 6 of this Plan.

Other Iter Canada Members will be responsible for financing (Royal Bank Financial Group), insurance (Marsh Canada), licensing (Canadian Nuclear Utility Services), electricity & tritium (Ontario Power Generation) and construction labour (Ontario Building and Construction Trades Council).



Figure 2.3: Iter Canada members and supporters



Iter Canada has a very experienced and active Board of Directors. The full listing of Directors and Official Observers is shown below, and they are pictured in Figure 2.4 on the following page. Independent Directors are chosen for their special expertise to help lead to the construction of Iter and its siting in Canada. The Observers to the Board are from all three levels of Government, showing their support for Iter Canada, although the federal and provincial levels of government are not Members of Iter Canada.

Roger Anderson	Regional Chair - Regional Municipality of Durham (Observer)
Peter Barnard	Chairman & CEO - Iter Canada
Richard Bolton	Independent director (former head of the Centre Canadien de fusion magnetique in Montreal)
Wayne Boyd	President and Chief Executive Officer - CanatomNPM Inc.
Chris Bunting	Chairman & CEO – Weber Shandwick International
Brian Caine	Partner - Ernst & Young Management Consultants
Jim Campbell	Director, Economic and Fiscal Analysis - Energy Policy Branch, Energy Sector, Natural Resources Canada (Observer)
Pierre Charlebois	Senior Vice President - Technical Services & Chief Nuclear Engineer, Ontario Power Generation
Don Dautovich	Special Advisor - Iter Canada
Patrick Dillon	Treasurer - Building & Construction Trades Council

Elizabeth Dowdeswell	Independent Director (former head of the United Nations environmental program)
John English	University of Waterloo
Norm Harrison	Executive Vice President, Armbro Enterprises Inc., Executive Vice President - BFC Construction Corporation
Mag Iskander	Vice President & General Manager - MacDonald Dettwiler Space & Advanced Robotics Ltd.
Michael Jolliffe	Vice President, Government Relations - AMEC Inc.
William McAleer	Member, Canadian Advisory Board - Marsh Canada Limited
Ian Milne	Vice President - Acres International Limited
John Mutton	Mayor - Municipality of Clarington
Marc Pignard	Managing Director, Global Project and Structured Finance - RBC Dominion Securities
Gary Polonsky	President, Ontario Institute of Technology (Observer)
Christopher Portner	Partner - Osler, Hoskin & Harcourt, LLP
Chris Riddle	Director - Technology & Training Development, Ontario Ministry of Energy, Science & Technology (Observer)
Dave Shier	Canadian Labour Congress
Shayne Smith	Director & General Manager - Wardrop Engineering Inc.
Murray Stewart	Managing Director – Iter Canada
Klaus Triendl	Group Vice President - SNC-Lavalin Inc.
Michael Wilson	Chairman & CEO- RT Capital Management Inc. (former Canadian Minister of Finance)
Michael Gough	Secretary – Iter Canada (Osler, Hoskin & Harcourt, LLP)



Figure 2.4: 1999/2000 Iter Canada Board of Directors

2.7 CONFIDENCE THAT ITER CAN BE IMPLEMENTED SUCCESSFULLY IN CANADA

Because of Iter Canada's advanced schedule for preparing this Plan, the Iter Parties will have clear and early evidence of the feasibility of implementing Iter in Canada.

At its May 25, 2000 meeting, Iter Canada's Board of Directors selected the Clarington site (formerly known as the Darlington site) as its choice to offer to the Iter Parties. Thus, the Iter Parties have the assurance that a developed site and existing infrastructure is available in Canada at the Clarington site and that strong public support exists in the Clarington and surrounding communities. This includes the support of all of the Mayors and Councils of the Greater Toronto Area (population of approximately 4.5 million). Attachment 2-A shows a number of these letters of support for Iter Canada and Canada hosting Iter, including:

- John Mutton – Mayor, and the Council of the Municipality of Clarington
- Roger Anderson – Chair, Region of Durham
- Rick Austin – Mayor of the Town Port Hope and Hope
- Mike Rosetter – Chief Administration Officer, Town of Port Hope and Hope (Council Resolution)
- Peggy Camp – Chief Administration Officer, The Corporation of the Township of Hamilton (Council Resolution)
- Kim Coates – Town Clerk, Township of Scugog (Council Resolution)
- Richard Stinson – Director of Legislative Services - The Corporation of the Town of Cobourg (Council Resolution)
- Trudy Merrill – Deputy Clerk, Township of Cramahe (Council Resolution)
- The Honourable Mike Harris, Premier of the Province of Ontario (2)
- Brian Wood, Acting Deputy Minister, Ministry of Economic Development, Trade and Tourism
- Honorable Ralph Goodale letter to Commissioner Busquin (2)
- Alain Vallee, Chairman European Fusion Engineering and Technology Board Members
- Lynn Morrow, Executive Director, Greater Toronto Services Board representing all of the municipalities in the Greater Toronto Area.

- Patrick Daniel, Chairman, Energy Council of Canada, to Minister Goodale
- Martyn Wash, Chairman, Organization of CANDU Industries
- Douglas Robson – President & COO, Ontario Chamber of Commerce
- Greater Oshawa Chamber of Commerce (Resolution)
- Allen Kilpatrick, President and CEO, AECL
- Jacques Lamarre, President and Chief Executive Office, SNC- Lavalin
- Shayne Smith, Director and General Manager, Wardrop Engineering Inc.
- Wayne Boyd, President and Chief Executive Office, Canatom NPM
- Roger C. Nichol, Executive Vice President, SNC-Lavalin
- Dr. Akira Hirose, Professor and Head, Department of Physics and Engineering Physics, Director, Plasma Physics Laboratory, University of Saskatchewan
- Dr. Anthony A. Haasz: Professor and Principal Investigator, Fusion Research; Director, University of Toronto Institute for Aerospace Studies (UTIAS) - University of Toronto
- Other endorsements received on the occasion of a presentation by Dr. Peter Barnard to the Empire Club of Canada, March 1, 2001.

Iter Canada has also established an experienced construction/project management consortium to undertake the detailed procurement for the Canadian scope and to manage and undertake the Canadian non-transportable scope and other obligations. This team of Canada's leading engineering and construction firms is experienced with projects of the scale of Iter both domestically and abroad.

An existing regulatory process is in place that is applicable to fusion. It is anticipated that the licensing plans initiated by Iter Canada and presented in Section 7 of this Iter Canada Plan should lead to a construction license within a two year period.

There is complete flexibility in establishing the Iter Legal Entity in Canada to meet the Iter Parties structural and organizational requirements leading to shared responsibility for the project's governance and open access to all scientific and technological results. In addition, Canada would be neutral to all Iter Parties in the

sense that it could not technically dominate the project and would be complementary in providing primarily the buildings and infrastructure.

2.8 ATTACHMENTS

2-A: Support and Endorsements for Iter Canada and Canada hosting Iter

2-B: Background information on Iter Canada Members

- ☐ **Acres International**
- ☐ **BFC Construction**
- ☐ **Canadian Nuclear Utilities Services**
- ☐ **CanatomNPM**
- ☐ **MacDonald Dettwiler**
- ☐ **Marsh Canada Limited / Marsh Inc.**
- ☐ **Osler, Hoskin & Harcourt LLP**
- ☐ **Royal Bank Financial Group**

Attachment 2-A:

**Support and Endorsements for Iter Canada and Canada
hosting Iter**

2-B: Background information on Iter Canada Members

ACRES INTERNATIONAL (www.acres.com)

Corporate Background:

Acres International is an employee owned company which was established in 1924, and is a leading North American engineering, planning and management company with a staff of 1000 which includes engineers, scientists, economists, technicians and administrative personnel. From offices across Canada, the United States and around the world, Acres carries out assignments for public utilities, private developers, industry, governments, and major foreign aid financing institutions. Assignments have been completed in over 100 countries.

The company is organized into operating divisions which work in three primary business sectors: Power, Transportation and Urban Infrastructure, and Mining and Heavy Industrial. These in turn draw on the resources of technical departments which encompass the basic engineering and project execution disciplines: civil, electrical, geotechnical, hydraulic, mechanical, procurement and project services. Other specialties include, economics, planning and environmental management.

Power

- hydroelectric power
- nuclear power
- thermal power generating facilities
- power systems
- operations support

Transportation and Urban Infrastructure

- airports
- highways and bridges
- rapid transit systems
- marine facilities
- urbane infrastructure

Mining and Heavy Industrial

- infrastructure support for mining projects
- heavy industrial engineering

The company offers expert project and program management capabilities and provides comprehensive multi disciplinary services from conceptual and planning studies through final engineering and construction supervision.

The Company has been involved with various assignments for the design, development and safety aspects of Canada's nuclear power plants and other nuclear

facilities. From the initial involvement with the Point Lepreau plant, the Company has continued to be involved with the CANDU nuclear power plants and facilities including engineering for the balance of plant (BOP) design for the 600-MW CANDU nuclear plant in south Korea; project and construction management services for the 600-MW Cordoba nuclear plant in Argentina; specialist design, technical assistance, studies and assessments for the Pickering, Darlington and Bruce nuclear developments, as well as assignments for nuclear power plants in USA and overseas, as shown in the following representative list.

Wolsung-1 Nuclear Power Plant, Korea

Complete engineering of the balance of plant (BOP) for the 600 MWe CANDU unit

Physical modeling of the cooling water intake structure

Shop inspection, quality assurance and expediting of equipment manufactured in Canada

Cordoba Nuclear Power Plant, Argentina

Project management, construction supervision and procurement services for structures, equipment and systems in reactor building and service building, for the 600 MWe CANDU nuclear power generating station built for Comision Nacional de Energia Atomica, Argentina.

CANDU 600 Study for Japan

Evaluation of the standard CANDU 600-Mwe nuclear steam plant (NSP) for introduction to the Japanese market. Preliminary modifications, estimates of construction costs and schedules were prepared.

Power System Evaluation

Assessment of the electrical distribution system under normal, upset and emergency conditions at Bruce Nuclear Power Development, Ontario, Canada

Nuclear Plant Auxiliary Heating Systems

I. Feasibility study, design and procurement of a new 500,000 lb/hr steam supply at Bruce Nuclear Power Development, Ontario, Canada

II. Study and evaluation matrix for Darlington nuclear power plant, Ontario, Canada, replacement auxiliary heating system rated at 50 MWe/180,000 lb/hr steam. Detail design and equipment specification in progress

Seismic Assessment

Assessment of seismic margin analysis of the critical plant shut-down systems at Pickering nuclear generating station, Ontario, Canada

Active Drain System

Design, scheduling and cost estimating for the active drain system at the Chalk River laboratory site, Ontario, Canada

Low-Level Radioactive Waste Management

Feasibility study of additional storage of low-level radioactive waste at an existing storage facility, Ontario, Canada

Liquid Active Wastes

Design of facilities for the long-term storage of radioactive liquid wastes resulting from the production of medical isotopes, Chalk River, Ontario, Canada

Groundwater Tracing

Tritium Pathway Analysis Modeling of groundwater flow to existing waste storage at the Bruce Nuclear Power Development, Ontario, Canada

Solid Active Wastes

Review of Low-Level Radioactive Waste cleanup criteria for contaminated soil, and recommendations for applying criteria to the Port Hope area waste sites, Ontario, Canada

Seismic Dynamic Analysis

Study of the feasibility of using background vibration to determine structural dynamic characteristics of components in nuclear power plants, for Atomic Energy Control Board.

Underground Storage Facility

Structural design of the intrusion resistant underground structure (IRUS) facility, Chalk river, Ontario, Canada

AUDITS AND EVALUATIONS OF U.S. NUCLEAR FACILITIES

Florida Power & Light

Diagnostic review of a year-long dual unit outage at the Turkey Point nuclear station, Florida, U.S.A.

Public Utility Commission of Texas

Retrospective prudence audit of the 2300 MWe Comanche Peak nuclear power plant, Texas, U.S.A.

Baltimore Gas & Electric Company

State reviews of an extended outage at the two-unit (845 MWe each) Calvert Cliffs nuclear power plant

Cleveland Electric Illuminating Company

Conducted an environmental monitoring program in Lake Erie in the vicinity of the Perry nuclear station

Central Power & Light Company

Retrospective prudence audit of the 1250 MWe South Texas Project nuclear power plant, Texas, U.S.A.

Boston Edison Company

Prudence review of an extended refueling outage of the 670-MWe boiling water reactor at the Pilgrim nuclear power station, Massachusetts, U.S.A.

Georgia Power Company

Prudence audit of the two unit (1140-MWe each) pressurized water reactor power plant, Vogtle, Georgia, U.S.A

Illinois Commerce Commission

Retrospective and prospective prudence audit of the 950-MWe Clinton power station and monitoring the plant construction until completion, Illinois, U.S.A.

Connecticut Department of Public Utility Control

Retrospective prudence audit of the 1150-MWe Millstone 3 nuclear generating station, Connecticut, U.S.A.

BFC Construction Group Inc. “BFC”

Overview:

BFC Construction is one of Canada’s most diversified and largest construction companies. Staff numbers approximately 3,000 people in Canada, including 500 permanent, and 2,500 non-permanent unionized trades people. BFC works in the Civil, buildings, Utilities, Industrial, Highway, Airport and Nuclear sectors.

BFC Construction has excelled in quality, service and innovation to earn a reputation as a best-in-class multi-discipline contracting organization. BFC Construction is part of Armbro Enterprises Inc., Canada’s largest publicly traded construction company with forecast year 2000 revenue of one billion dollars.

BFC’s long history of exposure to various types of projects has helped develop unique, best-of-class, in-house programs including Safety and Quality Assurance. Exposure to and intimate knowledge of these systems have allowed maximum efficiency and provided its clients with the most cost-effective construction solution for each unique project.

Company Description and Capabilities:

For the Iter project, BFC will utilize its four major divisions: BFC Civil; BFC Industrial; BFC Utilities and BFC Buildings.

BFC Civil is the lead division for the Iter project based on extensive experience in conventional and design build work in the Nuclear, Hydroelectric Power and heavy civil structures.

BFC Civil has undertaken many unique and technically sophisticated projects with great success:

BFC Civil pioneered the development of Canadian Nuclear power construction expertise in the 1950’s when the company built Canada’s first atomic reactor and research facilities. Since then, BFC Civil has provided specialized construction and management expertise for Canadian nuclear reactors for research, power generation and other nuclear related projects in Canada and around the world in the following countries; Peru, Taiwan, Romania, Korea and Argentina.

BFC Civil constructed the CN Tower in Toronto Canada, still the world’s tallest free standing structure.

BFC Civil was a founding member of the Canadian Highways International Corporation (CHIC) consortium selected to design and construct the first toll highway in Canada, a 69km stretch of the 407 highway north of Toronto containing over one hundred interchanges, fly overs and bridges. The second all electronic

tollway in Canada, the 46km long highway 104 near Truro, Nova Scotia, also constructed by this consortium, was opened in November, 1997.

BFC Industrial is a multi-trade construction group based in Cambridge, Ontario and Edmonton, Alberta. The group has fabrication, modularization and construction expertise in the industrial, cogeneration, automotive, pulp and paper, forest products, petrochemical, oil and gas, and mining industries. BFC Industrial owns and operates a 125,000 ft. fabrication shop about 1-1/2 hour drive from the Clarington Site for piping and modular construction. This ISO 9002 registered facility is available to be used for the Iter project to maximize efficiency and reduce costs.

The commercial building aspects of the Iter project will be addressed by BFC Buildings. BFC Buildings has provided services to many of the most notable high technology organizations in Canada in the areas research facilities and manufacturing facilities.

Through BFC Utilities, the Corporation engages in underground utilities work, including the installation of natural gas distribution lines, electrical services, watermains, storm drains and sewers.

BFC leads and participates in many joint ventures and alliances because we are team players and thrive in this environment. The Iter construction consortium members are all well known to us and we have successfully partnered with them on other projects. BFC Management and staff have the necessary management skills, technical ability and design-build partnering experience to undertake projects of any size and nature. Please refer to our company brochures and experience lists for additional information.

Experience Lists:

The following are some recent representative projects covering the wide range of our activities:

STE. MARGUERITE 3 POWERHOUSE

The powerhouse construction is one of the major projects of SM3 power development. The contract includes construction of tailrace tunnel, underground powerhouse excavation and concreting, construction of six deep shafts and concreting and other miscellaneous work. Total rock excavation to be moved is 270,000 cubic meters and total concrete quantity is 30,000 cubic meters. Total SM3 development will cost around \$1.5 Billion to produce power by the year 2001.

TOLL HIGHWAY 407

The project consists of the Development, Design, Build and Operation of a 69km electronic toll highway in the Greater Toronto area of the Province of Ontario, Canada. This multi-lane urban highway is the largest single civil engineering contract tendered in Canadian history and the first major infrastructure project in Canada to be developed by a public-private partnership.

The project incorporated 120 bridges in 29 interchanges, 15 grade separations, 13 river/creek crossings and 8 railway crossings. In addition, approximately 85km of sewer pipe, 11 million tonnes

of aggregates, 580,000 tonnes of open graded drainage layer, 600,000 tonnes of asphalt and 1 million cubic metres of concrete road base.

The high-tech toll road operates without collection booths making it one of the first non-stop, completely electronic toll highways in the world. Tolls are levied either from a photo based license recognition system or through a small electronic transponder mounted on the windshield of the vehicle.

NATHPA JHAKRI HYDROELECTRIC PROJECT

The 1500MW Nathpa Jhakri Hydroelectric project, located in Kinnaur and Shimla Districts of Himachal Pradesh, is a run-of-the river type development, proposed to harness hydroelectric potential of the upper reaches of the river Satluj.

A design discharge of 405 cumecs is proposed to be diverted through a 60.5m high concrete gravity dam, four intakes and four underground desilting chambers, a 10.15m diameter head race tunnel (HRT) terminating into 21m diameter and 225m deep surge shaft.

Along its route, the 27,295m long HRT encounters Manglad creek which is proposed to be crossed by lowering the tunnel to cross it as its bed level. Three pressure shafts, each of 4.9m diameter taking off from the surge shaft, will feed the discharge to six generating units of 250MW each housed in an underground powerhouse to utilize a design head of 42.5m.

The total cost of the project is approximately \$1.2 billion and is partially funded by the World Bank.

NEW WESTMINSTER TUNNEL

BFC Civil in a joint venture partnership were contracted to design/build the New Westminster Sky Train Tunnel and related structures.

The design/build tunnel project is 800m long and is being constructed using a "cut and cover" technique. The contract also includes building the tunnel portals, ventilation and emergency and maintenance access structures. The project is scheduled for completion in October, 2000

NEWFOUNDLAND TRANSSHIPMENT TERMINAL

The total project cost was about \$200,000,000 and utilized approximately 1,490,000 man-hours of labour. Construction of on-shore facilities on a greenfield site for trans-shipment of oil from the offshore Hibernia production platform including 1.8 mbbl storage and jetty for 130,00 dwt tanker Strategic alliance partner with Bantrel, Mobil, Chevron and Petro Canada.
BFC contract for civil, mechanical, electrical, \$47,700,000

CN TOWER

BFC Civil was awarded the contract for construction and construction management of the CN Tower - at 553m high, the tallest free-standing structure in the world.

Site preparation for the structure required excavation to below the level of Lake Ontario. Foundation excavated through 9m of earth into 7m of rock and installed a system of relief wells to prevent water seepage during the operation.

The tower foundation consists of 7,650 cu m of concrete. Once the foundation was in place, a special slipform was set up for construction of the tower. The most difficult aspect of designing the forms was to develop one which would curve. Not only did the perimeter of the legs curve, the walls thinned from 2.1m thick at the base to .335m thick near the top.

The slipform moved up with hydraulic pressure supported by a ring of climbing jacks. Cranes hoisted materials until the tower passed the 15m mark. Then three buckets mounted on the slipforming deck took over to lift concrete up the inside shaft. The "round-the-clock", five-days-per-week operation resulted in the tower growing at a rate of almost 6m per day.

To make certain the world's tallest free-standing structure stood straight, precision-made optical instruments, backed up with the traditional plumb bob, were utilized. Readings were checked and cross-checked as the structure inched skyward. Through this highly effective technique, the tower varies from absolute vertical plumbness by a maximum of 2.7cm.

The concrete structure houses broadcasting antennas for radio and TV networks, as well as visitor observation decks and a restaurant. The owners chose the 335m height for the pod; technical separation requirements for the various TV and radio signals dictated the remaining height.

The two observation decks are in the "sky pod", a circular seven-storey structure ranging from 30-42m in diameter and located at 335 and 365m elevations. Potential visibility from these heights is 120km. The sky pod also contains a 400-seat revolving dining room and lounge, broadcasting and transmission equipment and CN Telecommunication microwave facilities. These facilities are serviced by four elevators built in glass-faced shafts. A third observation deck is at 457m elevation.

Canada's severe winter climate posed special construction problems. An insulated skirting was devised to shield the slipformed concrete from sudden exposure to winter air and subsequent cracking. Slipforming during the winter was kept to 4m a day, leaving three days before concrete emerged from under the insulation. Approximately 7,650 cu m of concrete was formed each month, shrinking, as the tower narrowed, to 1,530 cu m a month at the upper reaches. Heating equipment was also installed to maintain the concrete specifications and to keep the working conditions tolerable.

PROJECT SPECIFICATIONS

*Total floor space (base): 2,320 sq m

Volume of concrete: 106,000 tonnes

Total weight of tower: 130,000 tonnes

Total weight of re-steel: 4,000 tonnes

Total weight of post-tensioned cable: 1,000 tonnes (130km)

TERMINAL III

BFC Civil was awarded the construction management contract for Terminal III at Toronto's Lester B. Pearson International Airport. The overall project entailed construction of a 24-gate terminal building, a 2800 car parking garage and a 500 room hotel.

The Great Hall or main processing area is the terminal's architectural centerpiece, its vaulted glass ceiling runs the entire length of the terminal and is a modern rendition, in glass and steel, of the great railway stations of the past. Two piers extend from the central terminal building where arrival and departure gates are located. Over 7,000 square meters of retail shops are located on the departure, arrival and in-transit levels.

The building's substructures and foundations are constructed of reinforced concrete and the superstructure is structural steel with metal decks and concrete toppings. The exterior is finished in metal with extensive glazing.

BFC Civil also oversaw construction of the approach road system and parking garage, 25 hectares of paved apron around the terminal, and installation of an extensive storm drain system. The hotel was completed under a separate contract.

BFC Civil built Terminal I at the Toronto Airport in 1964, as well as the terminal facilities at Dorval, Calgary and Vancouver International Airports.

ROSEAU DAM

This water development project was primarily funded by CIDA and will provide the capital city of Castries with 12,000 cubic meters of water per day to service a population of 58,000 people.

The overall project included the construction of a concrete-faced rockfill dam with crest spillway, diversion tunnel, cofferdams, low-level outlet and water intakes.

On September 10, 1994 after completing more than 80% of the project, St. Lucia experienced a tropical storm causing \$8 million damage to the work. After a 6 month reconstruction program, the project was finally completed in October of 1995 at a total cost of \$24,152,000.

POINT ACONI WATER INTAKE

The Point Aconi Coal Fired Generating Station uses seawater to condense the exhaust steam from the turbine. Seawater is drawn from a point 1000m off shore from a depth of 11m, through a velocity cap, an intake shaft, and a concrete lined tunnel driven 30m below the seabed to the forebay shaft.

The forebay shaft located on the shore, is 18m in diameter and 63m deep, and was sunk using conventional blasting methods. Each round was 1.8m in depth. A connector tunnel 30m long and 3.8m in diameter connects the forebay shaft to the pump house building.

The intake tunnel was bored 4.5m in diameter using a Jarva mark 12 Tunnel Boring Machine. Due to the potentially gassy environment, it is fully explosion proof and has a methane gas monitoring system. The tunnel will be concrete lined to a finished 3.7m diameter.

As foundation for the intake cap located 1000m off shore, a 20m diameter glory hole was excavated, without blasting, into the rock 11 to 15m below water surface. The excavation was leveled with tremie concrete and a crushed stone mattress.

The intake shaft was blind bored 3.9m diameter the Elev. -48m followed by installation below the sea of 2.7m diameter precast liners backfilled with concrete. The 1500 ton intake cap structure was built in a dry-dock in Halifax, towed 400 miles to Point Aconi, and installed on the foundation, 11m below water.

WEST WINDSOR POWER COGENERATION PROJECT

This 115MW combined cycle cogen plant, located on a six acre site in Windsor, Ontario, was built through a joint venture between BFC Industrial and Brown & Root. Brown and Root was responsible for engineering, procurement and commissioning, while BFC Industrial was responsible for construction.

The plant was designed around a single ABB Model 11N1 gas turbine and an ABB Steam Turbine.

The project was non-recourse financed and was successfully executed in 27 months on a turnkey basis, meeting rigid plant performance and completion date guarantees.

WHITBY COGENERATION PROJECT

This 50MW Simple Cycle Cogeneration Plant supplies process steam to the adjacent Atlantic Packaging paper mill and electricity to the Ontario Hydro grid system.

The plant is designed around a Westinghouse - Rolls Royce Trent Econopac gas turbine and utilizes an Innovative Steam Technologies Once-Through Steam Generator, which captures waste heat from the turbine exhaust gases, to produce the 150,000 lbs/hr of saturated process steam. Two 95,000 pph Nebraska package boilers provide standby steam generation service.

BFC Industrial was the E-P-C contractor responsible for design, construction, startup, commissioning, performance testing, and procurement of all equipment and materials with the exception of the gas turbine and OTSG.

LAKE SUPERIOR POWER COGENERATION PROJECT

This 110MW combined cycle cogeneration plant supplies process steam to an adjacent paper mill and electricity to the Ontario Hydro grid system. It utilizes two General Electric LM6000 gas turbines each rated at 40 MW and a 28.5 MW steam turbine. Waste heat from the exhaust gases of the natural gas fired turbines is recovered in two Deltak Heat Recovery Steam Generator units which in turn provide steam to the Steam Turbine and process.

The plant was built on a fast track schedule, synchronization and project completion were achieved 16 months and 19 months respectively after contract award. Contract performance guarantees and completion dates were met without incident.

BFC Industrial was the Balance of Plant Engineer-Procure-Construct contractor responsible for design, purchase of balance of plant equipment, construction and commissioning for this project.

BRUCE ALTERNATE STEAM SOURCE

BFC Industrial was the Engineer-Procure-Construct contractor for the construction of the Bruce Alternate Steam Source (BASS) plant on the Bruce Nuclear Generating Station site. This plant will produce 450,000 pph of saturated steam from three 150,000 pph package boilers. The steam produced is used at a nearby industrial complex for process and heating requirements.

BFC Industrial's construction scope includes civil, structural, mechanical, piping, electrical and controls installations. BFC is also responsible for complete design, procurement of equipment and commissioning assistance.

The plant was completed in 1999 under a fast-track schedule, relying on close communication and co-operation with its engineering subcontractor, Gryphon International to ensure successful completion.

NANTICOKE G.S. – BURNER REPLACEMENT

BFC Industrial is the Engineer-Procure-Construct contractor for the installation of 180 low Nox burners at Ontario Hydro's coal-fired Nanticoke Generating Station near Jarvis, Ontario. This work is being performed in four units (2,4,6,8) of this eight unit station. This contract is planned to be complete by September 1999.

NANTICOKE G.S. – PRECIPITATOR REBUILD

BFC Industrial is the Engineer-Procure-Construct contractor for the refurbishment of eight (8) Electrostatic Precipitators at Ontario Hydro's coal-fired Nanticoke Generating Station near Jarvis, Ontario. Work began in February 1998, is being performed in consecutive outages and is planned to be complete by April 2000.

IMPERIAL OIL LIMITED

BFC Industrial installed mechanical equipment, piping and instrumentation under contract with Fluor Daniel at this Imperial Oil refinery in Nanticoke, Ontario. All work was performed with an exemplary safety record and no lost time injuries through the course of construction. This project was part of a stretch of more than one million work-hours executed by BFC Industrial without a lost time injury.

STEELES TECHNOLOGY CENTRE, North York, Ontario

Located on approximately 50 acres in the north end of Toronto; the project consists of construction on one 11-storey plus 2 level u/g building and one 4 storey plus 2 levels u/g building as well as 900 stall parking deck, surface parking water retention system, municipal style roads, landscaping.

NORTEL NETWORKS WORLD HEADQUARTERS, Brampton, Ontario

This facility serves as Nortel World Headquarters and consists of a 740,000sf renovation, alteration and addition including a 350,000 sf conversion of existing plant manufacturing shop floor into high-tech areas.

The West Side Expansion involved approximately 310,000 sf of existing office space totally renovated to current standards. All finishes have a high-tech appearance utilizing terrazzo, metals, extensive glass and skylighting, plus slate, stone and carpeting. Partitions are a combination of ground face masonry, fixed drywall, granite faced, metal faced and demountable systems. Electrical and mechanical systems reflect current flexible requirements for leading-edge space.

HEWLETT PACKARD LIMITED, CANADIAN HEAD OFFICE, Mississauga, Ontario

This project consisted of a 250,000 sf state of the art, high-tech “intelligent” facility including approximately 60,000 sf of underground parking. It is situated on a 8HA (20 acre) pristine site preserving the native woodlots and designated conservation areas. The building is clad in porcelain enameled steel panels and glass to maintain the high-tech image. The scope of work included tenant fit-out to all areas including cafeteria, kitchen and fitness area.

HUDSON’S BAY STORES DATA CENTRE, Toronto, Ontario

ELI LILY RESEARCH AND DEVELOPMENT CENTRE, Toronto, Ontario

The Canadian high-tech research and development center for this pharmaceutical company is a 58,000 sf three-storey masonry and curtain wall clad building complete with two fully furnished research laboratories, conference facilities and general offices. Extensive mechanical systems and sophisticated architectural finishes were incorporated in the design.

HWY 407 ETR OPERATIONS CENTRE, Vaughan, Ontario

The Computer Operations Centre for Highway 407 features a 35,000 sf single-storey building with exterior walls consisting of a combination of curtain wall and precast. The project required complex heating, ventilation, cooling and electrical systems due to the housing of the sophisticated computer tolling equipment. Interior finishes were of a superior level to suit this high profile operations centre.

CONFEDERATION LIFE DATA CENTRE, Markham, Ontario

This project involved construction of a 42,000 sf main Computer Centre for this major life insurance company. The facility incorporated a 1500kw diesel UPS with all associated back up systems. The building was protected by a sophisticated security system and housed on a completely landscaped 3 acre site.

TORONTO STOCK EXCHANGE CONVERSION, Toronto, Ontario

The work on this high-profile project involved approximately 170,000 sf of interior office renovations and the addition of a 28,000 sf structural floor support in the old trading floor area. All finishes and details were of a high-tech nature.

The initial project subsequently branched off into several smaller renovation projects on the 5th and 6th floors of the facility.

BANK OF NOVA SCOTIA VISA PROCESSING CENTRE, Toronto, Ontario

The upgrade renovations to the Visa Processing Centre cover approximately 265,000 sf on one level and include 2 mezzanine area. Interior renovation work is being performed in both office and operations facilities which are fully occupied. This 12 phase project is completed after working hours to minimize disruption to personnel and operations.

CIBC QUANTUM PHASE II – TENANT FIT UP, Toronto, Ontario

The work completed at the CIBC facilities consisted of 76, 000sf tenant fit-up to a single floor connected between 3 towers – each separated by an atrium. The work space houses the electronic banking centre for CIBC. Finishes involved drywall, painting, carpet, tile work as well as extensive millwork including two 26ft custom wood sliding doors and two 9ft offset pivot wood doors for the boardroom entrances. The design also entailed curved walls and enclosures and specialty lighting.

NEWCOURT CREDIT GROUP, Queens Quay Terminal

The construction of Newcourt's Canadian Headquarters consisted of 150,000 sf of high-tech tenant fitout including 30,000 sf of high-end client services area. Unique elements of this project included installation of new access floor through the majority of the space and the utilization of an indirect lighting system.

NORTEL NETWORKS, Belleville, Ontario

The conversion of the Nortel Belleville present facilities includes to labs, training rooms, cafeteria, offices, HR areas, new access flooring, demising partitions, mechanical and electrical modifications, new flooring.

WSIB TENANT IMPROVEMENT, Toronto, Ontario

Tenant improvements consisted of the interior finishes of 19 floors totaling 525,000 sf of leaseable area. Work included Drywall, Millwork, Interior Glass, Painting and Wall-covering, all Flooring, Mechanical, Electrical, Audio Visual Systems and Equipment, Security and Signage.

All finishes were of a superior quality and work involved very sophisticated data cabling and communications systems. Work was performed in phases to allow for floor by floor occupancy of tenants.

BANK OF MONTREAL WORLD TRAINING CENTRE, Scarborough, Ontario

The Bank of Montreal World Training Centre is a 260,000 sf building located on eight acres of highly landscaped site. It encompasses a three storey high-tech classroom portion, 250 seat presentation hall, underground parking, complete kitchen/dining facilities, fitness areas, and 150 residential suites on 3 levels, equivalent to a 4-star hotel. All areas are dramatically interconnected by a multi-storey glass enclosed Archer's bow. Work consisted of complete fitout including such support facilities as a multi-purpose room (gym), swimming/whirlpool, dining room and reading areas, offices, instructional rooms, cafeteria plus a Grand Hall shaped in a bow configuration.

JOSEPH L. ROTMAN FACULTY OF MANAGEMENT, Toronto, Ontario

Located in the heart of the University of Toronto campus, the new educational facility features eight interactive state of the art classrooms, a computer centre equipped with leading edge technology and a complete business research library. The highlight of the building is the Fleck atrium located in the building's core which features custom flooring, rich wood sills, textured glass balustrades, unique curtain wall designs and a towering skylight. The atrium is surrounded by classrooms, administrative and faculty offices. The exterior is comprised of intricate combinations of brick and curtain wall and is accented with skylights and glass canopies.

SUN MICROSYSTEMS, Markham, Ontario

This 21, 240 sf fit up involves new drywall, partitioning, mechanical and electrical work, carpeting, resilient floor finishes, pre-finished millwork/casework, wood doors, finishing hardware and paint finishing. With the construction well underway Sun Microsystems promises to be a state of the art high-tech facility.

GENESIS MICROCHIP, Markham, Ontario

40, 000 sf tenant work for Genesis Microchip Corporation consisted of improvements on 3 floors including partitions, workstations, doors, floorwall finishes and office installations. High-tech static resistant flooring was installed in the computer area. Work has completed on time and on budget.

FED-EX CANADIAN HEADQUARTERS, Mississauga, Ontario

The Fed-Ex Headquarters projects involved the design-build of a 3 storey Class "A" office building with 1 level basement. The total building area is approximately 156,000 sf situated on a 12.04 hectare site. The facility features high-tech offices utilizing materials of the highest quality and an acoustically treated atrium detailed with limestone and marble flooring. The cafeteria offers a view of a nearby greenbelt area.

Owning Company: **Union Gas Limited**

Project Name: Union Gas General Contracts
Description: This project included the installation of Mains and Services
Location: Waterloo/Brantford, Windsor, Chatham, London, Sarnia
Completion: April 2000 - March 2002
Value: \$40,000,000

Owning Company: **City of Kitchener**

Project Name: Gas Pipeline Construction – General Contract
Description: This is a General Contract including the installation of Mains and Services
Location: Kitchener, Ontario
Completion: 1998 – 2001
Value: \$3,600,000

Owning Company: **Montreal Pipeline Limited**

Project Name: 18 Inch Mainline Gas to Oil Reconversion
Description: This project included the installation of 4.6 kilometers of 18” steel pipeline and intermittent repairs of pipeline within a 112 kilometer section.
Location: From Highwater at the U.S. Border to Montreal East
Completion: 1999
Value: \$2,000,000

Owning Company: **Union Gas Limited**

Project Name: Ancaster / Nanticoke Stelco Plant
Description: This project consisted of the construction of three sections totaling 42 kilometers of NPS 12” high pressure, steel natural gas line from Ancaster to Stelco Plant in Nanticoke, Ontario – Included in this project was a directional bore crossing of the Grand River.
Location: Nanticoke, Ontario
Completion: 1995
Value:

Owning Company: **Union Gas Limited**

Project Name: Bruce County Community Expansion
Description: This project consisted of the construction of 110 kilometers of NPS 1¼, 2 & 4” polyethylene natural gas distribution lines.
Location: Port Elgin, Ontario
Completion: 1998
Value: \$3,200,000

Owning Company: **Consumers Gas Company Limited**

Project Name: Central Region – Metro – General Contract
Description: This is a general contract including the installation and maintenance of all new pipeline facilities, as well as, commercial and residential services ranging from ½” to 20” in diameter.
Location: Metropolitan Toronto, Ontario
Completion: April 1997
Value: \$11,000,000

Owning Company: **Consumers Gas Company Limited**

Project Name: Central Region – North – General Contract



Description: This is a general contract including the installation and maintenance of all new pipeline facilities, as well as, commercial and residential services ranging from ½" to 20" in diameter.

Location: Newmarket to Lake Simcoe, Ontario

Completion: December 1996 – March 2001

Value: \$19,000,000

Owning Company: **Sable Offshore Energy Incorporated**

Project Name: NGL Pipeline Installation

Description: This project included the installation of 25 kilometers of dual 8" steel pipe for natural gas liquids

Location: The project was located between Goldboro and Point Tupper, Nova Scotia

Completion: 1999

Value: \$

Owning Company: **Sable Offshore Energy Incorporated**

Project Name: Canso Strait Crossing

Description: This project included the direct lay of dual 8" steel pipe on the bottom of the Canso Strait for natural gas liquids. Crossing width 1.65 kilometers

Location: Point Tupper – Cape Breton Island, Nova Scotia

Completion: 1999

Value: \$1,200,000

Owning Company: **Enbridge Consumers Gas**

Project Name: NPS 16 Pipeline Contract

Description: This project included the installation of 4 kilometers of 16" steel pipeline including three major river crossings involving 26" casings.

Location: Near Sarnia, Ontario

Completion: 1999

Value: \$2,800,000

Owning Company: **Union Gas Limited**

Project Name: Bentpath East and Booth Creek Storage Development Project

Description: This project included the installation of 6.3 kilometers of 16" steel pipeline.

Location: Sarnia, Ontario

Completion: 1999

Value: \$2,200,000

Owning Company: **Tecumseh Gas**

Project Name: Coveny Storage Pools

Description: This project consisted of the construction of 15 kilometers of NPS 16" high pressure steel natural gas line. Included in this project was the construction of 10 NPS 12" gathering lines.

Location: Sarnia, Ontario

Completion: 1997

Value: \$2,200,000

Owning Company: **Union Gas Limited**

Project Name: Owen Sound Reinforcement

Description: This project included the installation of 17 kilometers of 12" steel pipeline.

Location: St. Jacobs, Ontario

Completion: 1999

Value: \$2,000,000

Owning Company: **Union Gas Limited**

Project Name: Agrium Mine Project

Description: This project included the installation of 28 kilometers of 4" steel pipeline.

Location: District of Cochrane, Ontario

Completion: 1998

Value: \$1,300,000

Owning Company: **Union Gas Limited**

Project Name: Nanticoke Industrial Project

Description: This project consisted of the construction of 22 kilometers of NPS 12" high pressure steel natural gas line to feed the Lake Erie Steel plant.

Location: Nanticoke, Lake Erie, Ontario

Completion: 1998

Value: \$1,500,000

Owning Company: **Consumers Gas**

Project Name: Rockland / Cumberland lateral

Description: This project consisted of the construction of 18.5 kilometers of NPS 6" high pressure steel gas line.

Location: Rockland, Ontario

Completion: 1996

Value: \$900,000

CANADIAN NUCLEAR UTILITIES SERVICES:

CNUS is a partnership between CANATOM NPM, Inc. of Canada and SCIENTECH Canada, Inc., (a subsidiary of SCIENTECH, Inc. of the U.S.A.).

CNUS combines the strength of its two parent organizations. CANATOM NPM has worked within the CANDU industry since its early beginnings in the 1960's. Working in support of CANDU units, both within Canada and overseas, CANATOM NPM has broad experience in CANDU-specific technology, engineering, construction, project management, and operations support. One of Canada's largest engineering contractors, SNC Lavalin, and a leading Canadian Construction Company, BFC Construction, own CANATOM NPM.

SCIENTECH is widely recognized as a pre-eminent supplier of engineering, analysis, and technical support to nuclear utilities, government research, and regulatory agencies in 25 countries worldwide since 1983. These services make use of SCIENTECH's expertise in regulatory analysis, environmental compliance, condition assessments, environmental qualifications, vulnerability analysis, emergency response, systems engineering, information technology, safety and risk evaluations, nuclear safety analysis, licensing and plant security.

With combined capabilities, experience and resources of CANATOM and SCIENTECH, CNUS is in an excellent position to meet the increasing demands for technology and technical evaluations created by changing products, services and markets.

Specialized services include:

- Licensing of nuclear facilities,
- Plant engineering and safety evaluations,
- Security safety design and upgrade,
- Instrumentation and performance monitoring systems,
- Information technologies and their application,
- Facility decommissioning and environmental compliance,
- Strategic planning and consulting,
- Project management,
- Staffing and training, and
- Operations and maintenance assistance.

Canadian nuclear utilities are experiencing rapid change in response to a need to offer enhanced services in a price-competitive world. This transformation requires effective application of technology, information, and new approaches built on a solid platform of experiences to achieve success. CNUS intends to be the leading Canadian nuclear utility services company, offering a broad array of services and products to help its customers meet the challenges of the future.

CNUS operates out of its headquarters in Oakville, Ontario, Canada.

CNUS AND THE ITER PROJECT



BACKGROUND

CNUS is a partnership between two leading companies in the nuclear industry, CANATOM NPM, Inc. of Canada, and SCIENTECH Canada, Inc. (a subsidiary of SCIENTECH, Inc. of the United States of America).

CNUS combines the strength of its two parent organizations:

CANATOM NPM has worked within the Canadian regulatory regime since the early beginnings in the 1960's. Working in support of CANDU units, both within Canada and overseas, CANATOM NPM has broad experience in CANDU specific technology, engineering, construction, project management, and operations support. In addition, CANATOM NPM has extensive experience in the construction and operational management of PWR and BWR plants acquired during a decade or more of prudence audits and investigations in the United States of America. Canada's two largest engineering contractors, AGRA-Monenco and SNC-Lavalin, and a leading Canadian Construction Company, BFC Construction, wholly own CANATOM NPM. Resources of CANATOM NPM's parent companies can be made available to **CNUS**.

SCIENTECH is widely recognized as a pre-eminent supplier of engineering, analysis, and technical support to nuclear utilities, government research, and regulatory agencies in 25 countries worldwide since 1983. In 1996, SCIENTECH acquired NUS Information Services (NUS), through which it now provides the most used and comprehensive NRC licensing and operational support information services in the world. In 1998 and 1999, SCIENTECH acquired NES Inc. and EGS Inc. both of who are well known in providing operational support services to US Nuclear Utilities.

CNUS can draw from over 1000 highly knowledgeable regular staff from its two parent organizations. As a result of acquiring NUS Inc., SCIENTECH also manages the largest pool of nuclear experts available on a contracted basis. Similarly, CANATOM NPM has established a pool of available engineering and technical expertise, the majority with CANDU experience. Finally, CANATOM NPM is able to draw upon its parent organizations, SNC-Lavalin and BFC Construction for further resources as needed.

RELATED EXPERIENCE

CNUS has been selected to lead the licensing activities for the ITER Project. This involves applying for a site license with the Canadian regulatory agency, the Canadian Nuclear Safety Commission (CNSC).

CNUS is currently managing and providing the Licensing Basis Restoration Project for Ontario Power Generation (formerly Ontario Hydro). This major project is

aimed at redefining and re-assembling the licensing basis for 16 CANDU Operating Units owned by Ontario Power Generation (OPG).

CNUS is also providing Bruce Power Inc. (owned by British Energy) with licensing support to prepare their submission to the CNSC for the transferring of OPG's operating license to Bruce Power Inc.

CNUS is currently providing New Brunswick Power with licensing support for their licensing basis. This project involves preparing NB Power's submission for its Point Lepreau Refurbishment Project. **CNUS** will be providing New Brunswick Power with experienced licensing experts to develop and guide the regulatory strategy associated with the refurbishment of New Brunswick Power's Point Lepreau Generating Station. The purpose of the regulatory strategy will be to ensure that a clearly understood basis for the licensing of the refurbished plant is available by the end of the current planning phase and can contribute to the NB Power's decision to proceed with the refurbishment of the plant.

OWNERS OF CNUS

CANATOM NPM Inc.

CANATOM NPM Inc. was founded in 1967 by three leading Canadian consulting companies: Montreal Engineering Company Ltd. (Monenco), Shawinigan Group Inc. (later bought by Lavalin), and SNC Enterprises Ltd. CANATOM NPM's owners are now SNC-Lavalin and BFC Construction. CANATOM NPM operates out of its principal offices located in Montreal and Toronto. CANATOM NPM staff is backed by the diversified expertise of its parent companies, also located in Montreal, Toronto and other cities within Canada and around the world. The combined staff from CANATOM NPM and its parent companies exceeds 10,000 employees.

CANATOM NPM specialises in Engineering, Project and Construction Management (EPCM) and related services for nuclear power stations and heavy water plants. Other services provided by CANATOM include inspection, expediting, cost estimates, audits, technical reviews, feasibility studies, site investigations and evaluations, plant start-up and operations assistance and training. CANATOM NPM has provided training programs including computer based training and classroom training in health physics to Ontario Power Generation (formerly Ontario Hydro). CANATOM NPM also conducts prudency audit management reviews and provides services in cost and schedule reconciliation for state regulatory agencies and nuclear utilities in the United States of America.

In addition, CANATOM offers services in Radioactive Material Management, including Decommissioning, Environmental Management Systems and Radiation-Waste Management.

CANATOM NPM offers its customers a range of services related to plant performance improvement. In the latter area, CANATOM NPM is involved in providing direct engineering support to operating nuclear plants in Canada.

SCIENTECH Inc.

SCIENTECH is an employee-owned company that specializes in scientific and engineering services. The company has a long history of providing regulatory and licensing services in support of nuclear facilities around the world. SCIENTECH was founded in 1983 and performs work for the U.S. Nuclear Regulatory Commission (NRC), the U.S. Department of Energy (DOE), and nuclear utilities and regulators throughout the world. In 1996, SCIENTECH acquired Nuclear Utility Services (NUS). NUS has nuclear consulting experience dating back to 1960.

SCIENTECH has extensive experience in providing support to the U.S. NRC in research and regulation of domestic and international nuclear power facilities. SCIENTECH achieved the position as largest independent contractor to the NRC in 1995 and currently supports all of the technical divisions of the NRC. In the past 12 years, SCIENTECH has successfully completed more than 24 separate NRC contracts and more than 300 separate tasks.

SCIENTECH's expertise covers the full spectrum of consulting engineering services, including: program, contractual, and financial management; licensing services; regulatory services; risk assessment; safety analysis; engineering and environmental services; nuclear facility operations, maintenance, and decommissioning; systems safety; and quality assurance. SCIENTECH is also recognized for its ability to successfully transfer nuclear safety technology to host countries, and train regulatory personnel in effective safety management.

SCIENTECH has annual revenues of \$80 million and over 700 personnel located in 29 offices throughout the world. About half of the company's engineers have advanced training and have been awarded Masters or Doctorate degrees. SCIENTECH's staff averages more than 15 years of professional nuclear-related experience.

CNUS EXPERIENCE

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Canadian nuclear utilities are experiencing rapid change in response to a need to offer enhanced services in a price-competitive world. This transformation requires effective application of technology, information, and new approaches built on a solid platform of experiences to achieve success. CNUS intends to be the leading Canadian nuclear utility services company, offering a broad array of services and products to help its customers meet the challenges of the future.

International and Domestic Experience

CNUS and its partners, CANATOM NPM and SCIENTECH, have considerable international and domestic experience in the areas of nuclear safety, CANDU design engineering and related nuclear areas. As part of their domestic experience, they have carried out numerous projects for one of the largest Utilities in the world, Ontario Power Generation (OPG) in Ontario, Canada. Most recently, CNUS was awarded the Licensing Basis Restoration (LBR) Project from OPG.

Tables 1 and 2 summarize the international experience of SCIENTECH and CANATOM NPM in the areas of nuclear safety and CANDU design, construction and related areas. Tables 3 and 4 summarize key projects carried out for Ontario Power Generation by SCIENTECH and CANATOM NPM, respectively.

TABLE 1

Nuclear Safety and Related Work by SCIENTECH

Customer Name/Location Contact Name Phone Number	Project Title	Information
U.S. Nuclear Regulatory Commission Rockville, MD Jim Carter 301-415-1288	Current Licensing Basis for Millstone Unit 1 NPP	\$1,600,000 1996-1997
Baltimore Gas & Electric Co. Lusby, MD Barth Doroshuk 410-495-4803	License Renewal for Calvert Cliffs Units 1 & 2 NPP	\$1,500,000 1996-present
Detroit Edison Co.	Licensing Support/UFSAR Update	\$8,500,000



Customer Name/Location Contact Name Phone Number	Project Title	Information
Detroit, MI John Tibai 313-586-4289	for Fermi Unit 2 NPP	1970-1997
Public Service Electric & Gas Co. Salem, NJ Chris Pupek 609-339-5336	PSA/PRA Support including External Events for Salem Units 1&2 and Hope Creek NPPs	\$1,200,000 1994-1997
Korea Power Engineering Co. S.K. Kang Seoul, Korea 82-331-289-4299	PSA/PRA Support for Ulchin, Wolsung, Yonggwang, and Kori NPPs	\$1,100,000 1994-present
Electric Power Research Institute Palo Alto, CA Frank Rahn 630-855-2037	On-Line Risk Monitoring Research and installation of Safety Monitor at Wolf Creek, Callaway, and Comanche Peak NPPs	\$625,000 1995-present
Department of Energy International Nuclear Safety Program Walt Pasadaq 301-903-3628	Integrated Safety Assessment (including PSA and T-H) at South Ukraine, Rivne, and Zhaparozia NPPs	\$4,200,000 1996-present
EPZ The Netherlands Mario Van de Boorst 31-113-35-6000	PSA/PRA including Level 1, Level 2, limited scope Level 3, External Events and Safety Monitor for Borselle NPP	\$1,200,000 1992-1995 1997-present
Virginia Power Co. Richmond, VA Dave Bucheit 804-273-2264	PRA update, Risk-based ISI, Maintenance Rule support, and Safety Monitor for Surry and North Anna NPPs	\$1,500,000 1994-present
American Electric Power Co. Benton Harbor, MI Steve Brewer 616-697-5008	Document Conversion Services for D.C. Cook NPP	\$800,000 1992-present
Arizona Public Service Co. Phoenix, AZ Glen Michael 602-393-5750	Document Conversion Services for Palo Verde NPP	\$850,000 1994-present
Northern States Power Co. Minneapolis, MN Edie Boyer 612-337-2228	Document Conversion Services for Monticello NPP	\$800,000 1994-present
Houston Lighting & Power Co. Houston, TX Wayne Harrison 512-972-7298	Document Conversion Services for South Texas Project NPP	\$850,000 1992-present
American Electric Power Co. Benton Harbor, MI Steve Brewer 616-697-5008	Commitment Management System for D.C. Cook NPP	\$875,000 1994-present
Virginia Power Co. Richmond, VA John Benton 804-273-2228	Design Basis Document Library Series Revision and Updating Surry Units 1 & 2 and North Anna Units 1 & 2 NPPs	\$500,000 1997-present

Customer Name/Location Contact Name Phone Number	Project Title	Information
New York Power Authority White Plains, NY Joseph Morrison 914-681-6379	Design Document Open Item Closure for Indian Point 3 and James A. FitzPatrick NPPs	\$250,000 1994-1995
Carolina Power & Light Co. Raleigh, NC James Deitrick 919-546-6405	Design Basis Document Validation for Brunswick NPP	\$450,000 1993-1994
Public Service Electric and Gas Co. Hancock's Bridge, NJ Frank Safin 609-339-1265	Thermal-Hydraulics Model, Development and Training, and Plant Event Analysis	\$400,000 1985-present
Duke Engineering & Services Co. Bolton, MA Paul Bergeron 978-568-2121	Independent Assessment of Safety Calculations	\$95,000 1998
U.S. Nuclear Regulatory Commission Rockville, MD Dr. Tim Lee 301-415-6479	RELAP5 Computer Code maintenance	\$1,500,000/year 1997-present
U.S. Nuclear Regulatory Commission Rockville, MD Dr. Gene Rhee 301-415-6489	Integral Test Facility Calculations Using RELAP5/MOD3	\$1,300,000 1996-present
U.S. Nuclear Regulatory Commission Rockville, MD Dr. David Ebert 301-415-6501	TRAC Code Consolidation and Development and TRAC-B Code Maintenance	\$2,000,000 1997-present
U.S. Nuclear Regulatory Commission Rockville, MD Ed Throm 301-415-3151	Technical Review of AP600 Passive Containment Cooling Code WGOTHIC, Testing, and Application Models	\$450,000 1996-present
Entergy Operations, Inc. Vasant Bhardwaj (501) 964-8459	Design Configuration Documentation Project at ANO	\$1,000,000 1992
Rochester Gas and Electric Corporation Rochester, NY Eugene Voci (716) 724-8080	DBD Program for Safety Injection System	\$250,000 1992
Rochester Gas & Electric Corp. Rochester, NY Eugene Voci 716-724-8080	Performance-based Audit of EQ Program for Ginna NPP	\$100,000
Florida Power Corp. Crystal River, FL	EQ Maintenance Program and Support	\$250,000

Customer Name/Location Contact Name Phone Number	Project Title	Information
Al Barnard 305-694-3125	for Crystal River NPP	
Entergy Operations, Inc. Russelville, AR Joe Kowalewski 501-964-5512	Evaluation of Equipment on EQ Master List, ANO Units 1 and 2 NPPs	\$100,000
Virginia Power Co. Richmond, VA Bill Corbin 804-23-2239	Comprehensive EQ Support Including Update of EQ Master List	\$350,000
Carolina Power & Light Company Raleigh, NC Mike Macon (919) 546-7504	Electrical Distribution System Design Basis for H. B. Robinson	\$750,000

TABLE 2
CANDU Design, Construction and Related Work by CANATOM NPM

Customer Name Location	Project Title	Information
Wolsong 2, 3 & 4 (Korea)	AE for BOP and BNSP	3x600 Mwe CANDU HWR
Wolsong 1 (Korea)	EPC for BOP and BNSP	600 Mwe CANDU PHWR
Gentilly 2 (Canada)	EPC for BOP and BNSP	600 Mwe CANDU PHWR
Embalse (Argentina)	EPC for BOP and BNSP	600 Mwe CANDU PHWR
Gentilly 1 (Canada)	Conceptual Engineering	350 Mwe CANDU BLW
Cernavoda 1 (Romania)	EPC for BOP and BNSP	600 Mwe CANDU PHWR
RAPP 1 (India)	Design Studies	200 Mwe CANDU PHWR
RAPP 2 (India)	Design Studies	200 Mwe CANDU PHWR
KANUPP (Pakistan)	Design Studies	125 Mwe CANDU PHWR
CANDU-3 (Canada)	Civil and Process Design	400 Mwe CANDU PHWR
Tokamak de Varennes (Canada)	Reactor, electrical, civil, process cooling design	Tokamak Fusion Reactor
Sudbury Neutrino Observatory (Canada)	Project Management, engineering, procurement, construction	Underground Neutrino Capture Observatory
Taiwan Research Reactor (Taiwan)	Project Mgt. Design, Procurement, Construct, Commission	40 MWt Research Reactor
Point Lepreau (Canada)	BNSP and BOP (turbine island) EPC, field eng. commissioning and operator training	600 Mwe CANDU PHWR
Cajun Electric Power Co-operative	River Bend	Prudency Audit
New York Public Service Commission	Nine Mile Point 2	Prudency Audit
New York Public Service Commission	Shoreham	Prudency Audit
Pennsylvania Public Utility Commission	Peach Bottom 2 and 3.	Prudency Audit
Arizona Corporation Commission	Palo Verde	Prudency Audit
Arizona/California/Texas/New Mexico Commissions	South Texas 1 and 2	Prudency Audit
Commonwealth Edison Company	Braidwood 1 and 2	Prudency Audit
Commonwealth Edison Company	Byron 1 and 2	Prudency Audit
North Carolina Utilities Commission	Shearon Harris 1	Prudency Audit
Ohio Public Utilities Commission	David Besse	Prudency Audit
Pennsylvania Public Utility Commission	Beaver Valley 2	Prudency Audit
Olgethorpe Power Corporation	Vogtle 1	Prudency Audit
New York Public Service Commission	Salem 1 and 2	Prudency Audit
New York Public Service Commission	Indian Point 2	Prudency Audit

TABLE 3**SCIENTECH Projects for Ontario Power Generation**

Date	Facility	Scope
1995	Pickering Nuclear Generating Station	RCM Training
1996	Bruce Nuclear Generating Station "B"	RCM Training
1996	Pickering Nuclear Generating Station	Maintenance Procedure Writer's Guide
1996	Pickering Nuclear Generating Station	Maintenance Procedures Pilot Program
1996	Pickering Nuclear Generating Station	Operations Procedure Writer's Guide
1996	Pickering Nuclear Generating Station	Operations Procedures Pilot Program
1996	Bruce Nuclear Generating Station "A"	RCM Program Development and Implementation
1997	Bruce Nuclear Generating Station "B"	RCM Program Development and Implementation

TABLE 4**CANATOM NPM Projects for Ontario Power Generation**

Date	Unit/Facility	Scope
Complete	Darlington NGS	NSA QA – Staff Augmentation
Complete	Darlington NGS	NSA QA – Staff Augmentation
Complete	Darlington NGS	QA Procedures – Staff Augmentation
Complete	OHN-General	NSD Audit Review – Staff Augmentation
1996	Pickering NGS	Spare Parts – Staff Augmentation
Complete	OHN-General	QA Used Fuel Disposal – Staff Augmentation
1996	Darlington NGS	Configuration Management
1996	Bruce NGS	Project Planning - EQ
1996	OHN – General	SER Review
1997	Bruce NGS	Steam Generator Life Management
1997	Bruce NGS	Estimate Review for Fuel Storage Equipment
1997	Bruce NGS	Dry Fuel Storage Container Study
1997	Bruce NGS	Qual. Engineering Procedure Review
1997	Darlington NGS	Nuclear Safety Assessment
1997	Pickering NGS	Steam Generator Life Management
1997	Bruce NGS	MISA Project Definition
1997	Bruce NGS	Project Planning
1997	Bruce NGS	Configuration Management
1997	Bruce NGS	Service Water Design Review
1997	OHN – General	Operational Experience Review
1997	Bruce NGS	MISA II Detail Design
1997	Bruce NGS	Commissioning Support
1980-82	Pickering NGS	ECIS Design
1985	Bruce NGS	Auxiliary Power System Design
1986-88	Darlington NGS	Spent Fuel Bay Design
1988	Bruce Institutional Shut Down	Review of Loss of License event.
1988-1991	Operational Audits	For Ontario Safety Review

Canatom NPM Inc. (www.canatomnpm.ca)

CANATOM Inc. and NPM Nuclear Project Managers Canada Inc. merged in 1998 into Canatom NPM Inc. “CANATOM NPM” and is Canada’s largest private sector nuclear engineering and supply company engaged worldwide in engineering, equipment supply, project management and construction.

Canatom NPM specializes in the following:

- The Balance of Nuclear Steam Plant (BNSP) and Balance of Plant (BOP) for CANDU nuclear power stations
- Equipment supplier for the Nuclear Steam Plant (NSP) for CANDU nuclear power stations
- Heavy-water plants
- Nuclear research facilities, including experimental fusion installations
- Nuclear waste management
- Support to operating plants
- Management audits.

Ownership

CANATOM NPM is a subsidiary of SNC-Lavalin (61%) and BFC Construction (39%). CANATOM NPM's operations are backed up by the expertise of its parent companies, which have a combined staff of over 10,000 employees.

The parent companies of CANATOM NPM are engineers, constructors and project developers with comprehensive financing capabilities and experience. These companies are active in diverse fields, including: power, mining, chemical, telecommunications, transportation, environmental, oil and gas, water treatment, geological, geotechnical and manufacturing.

Current Project Activities

- ***Qinshan Nuclear Units 1 and 2, China.*** CANATOM NPM is responsible for the supply of the NSP equipment, Site project, construction and commissioning management services for the complete units, and engineering and design for the BNSP portion of the 2 x 700 MW CANDU Nuclear units under construction in China. The BNSP includes all reactor service systems and all containment structures.
- ***Hong Kong Radwaste.*** Characterizing and repackaging radwaste in Hong Kong
- ***Gentilly-2 - Québec, Canada.*** CANATOM NPM is providing engineering services for various plant modifications.
- ***Atomic Energy of Canada.*** Assistance to AECL on new CANDU plant prospects.

Joint Ventures:



- **CS&W Nuclear** - A joint venture with Stone & Webster to provide project management, engineering, construction management and configuration management services to Ontario Power Generation nuclear plants. Present projects include three service projects at Pickering B
- **CNUS**- A joint venture with Sciencetech to provide environmental qualification, design basis, licensing, plant life extension and other services to Ontario Power Generation, NB Power and Hydro-Québec nuclear plants. Present work load includes Licensing Basis Establishment for OPG, Site Security at Bruce, Reactor Building life assessment at Point Lepreau, Systems condition assessment at Point Lepreau, and Environmental Qualification at Gentilly2.
- **CTECH**- A joint venture with AEA Technology to strengthen our entry into the highly competitive decommissioning / nuclear waste management. Present work load includes a turnkey project at Bruce for In-Station Used Fuel Dry Storage.
- **CANEC**-A joint venture with BFC Construction, Comstock and Stone & Webster to manage Engineering, Supply and Construction of Pickering A return to service

Past Experience

- **Wolsong Nuclear Units 2, 3 and 4 - Republic of Korea.** CANATOM NPM supplied the NSP equipment, and provided architect-engineering and related services (engineering and design, procurement, project and construction management assistance) covering BOP and BNSP portions of three CANDU 6 nuclear power plants which went into service in 1997, 1998 and 1999.
- **Sudbury Neutrino Observatory, Ontario, Canada.** The Sudbury Neutrino Observatory is a neutrino detector. Scientists will detect and measure the characteristics of neutrino particles. The detector consists of a large underground cavity filled with extremely pure water. Suspended in the cavity are two concentric spheres. The smaller is a 12-meter-diameter sphere made of acrylic plastic filled with 1,000 tonnes of heavy water; the larger is a stainless-steel geodesic structure with a diameter of 19 metres. It supports some 9,500 photo-multiplier tubes capable of detecting the Cerenkov light, which arises on the interaction of a neutrino with heavy water. The project management, engineering, procurement and construction management was carried out by CANATOM NPM Inc. and AGRA-Monenco.
- **Tokamak de Varennes, Centre canadien de fusion magnétique (CCFM) - Québec, Canada.** The Tokamak de Varennes is a fusion research device sponsored by Hydro-Québec and the Institut National de Recherche Scientifique, affiliated with the University of Québec. The Tokamak is installed at Hydro-Québec's IREQ laboratory, and it is the major force behind Canada's fusion research program. It has been making a useful and appreciated contribution to the world's magnetic fusion research program.

CANATOM NPM was responsible for the design of the Tokamak proper, the related civil works, cooling systems and electrical power distribution system. Since start-up in 1986, CANATOM NPM has played a continuing role in the CCFM, supplying key members to the CCFM engineering and operating staff.

- **Cernavoda-1 - Romania.** CANATOM NPM provided engineering and design services for the BNSP portion of the station. In addition, as part of Nuclear Construction Managers (NCM), a joint venture with BFC, CANATOM NPM provided construction management assistance to complete the construction of Unit No. 1. In early 1994, some 60 NCM employees were working in Romania.

- ***Lepreau-1, New Brunswick Electric Power Commission - Canada.*** CANATOM NPM provided BNSP and BOP (Turbine Island) engineering and procurement services, site assistance in construction, commissioning and operation training for this CANDU 6 unit.
- ***Gentilly-2, Hydro-Québec - Canada.*** CANATOM NPM provided complete engineering and procurement services, plus resident engineering assistance, for all BNSP and BOP systems and structures for this CANDU 6 unit.
- ***Wolsong-1, Korea Electric Power Corporation - South Korea.*** CANATOM NPM provided complete engineering and procurement services and resident engineering assistance for BNSP and BOP systems and structures for this 600 MWe unit. In addition, CANATOM NPM seconded personnel to AECL's Project Management Team (PMT) to manage the project, including the Project Director, Deputy Project Director and other key personnel.

The following is a summary of the CANDU nuclear power plant projects in which CANATOM NPM is providing and has provided engineering and other services:

Qinshan 1,2 (China)	1400 MWe
Wolsong 2, 3 and 4 (Korea)	1950 MWe
Wolsong 1 (Korea)	629 MWe
Gentilly-2 (Québec, Canada)	635 MWe
Point Lepreau (New Brunswick, Canada)	650 MWe
Embalse (Argentina)	600 MWe
Gentilly-1 (Québec, Canada)	250 MWe
Cernavoda-1 (Romania)	705 MWe
RAPP 1 (India)	135 MWe
RAPP 2 (India)	187 MWe
KANUPP (Pakistan)	<u>125 MWe</u>
TOTAL	7266 MWe

MACDONALD DETTWILER:

MacDonald Dettwiler is an information company that provides essential information from anywhere in the world for decision making in the workplace. The Company operates its business through two principal groups, the Information Products Group and the Information Systems Group.

Information Systems Group

The Information Systems Group provides mission critical information systems. Every business and government organization has key objectives or missions; for example, to maintain an up-to-date forest inventory, to deliver passengers safely to a location, to charge a criminal or to monitor and map the sea ice in the Arctic. MacDonald Dettwiler's systems help automate and provide the information required to accomplish those missions that are critical to an organization or government. MacDonald Dettwiler provides mission critical information systems for three major application areas:

- Enabling the Mobile Workforce -including astronauts, policemen, realtors, firefighters, and pilots. These systems include pilot briefing systems, police records systems, emergency coordination systems, space robotic systems, remote diagnostic systems and associated wireless and Internet distribution systems. They provide the relevant information, tools, and communications for pilots, police officers, emergency response teams, astronauts, and medical specialists to do their jobs efficiently and safely wherever they are.
- Monitoring Activities on the Planet -including geographic features, natural resources and the impact of human activity on the planet. These systems include spaceborne radar imaging satellites, airborne radar imaging systems, subsea sonar imaging systems and the associated receiving, processing and distribution systems on the ground. The systems provide imagery, data and interpretation tools used for economic planning, scientific analysis, resource management, national security and law enforcement.
- Managing Mobile Assets -including aircraft, trucks, containers and personnel. These systems include airspace management systems, fleet management systems, logistics and training systems and associated communication and control infrastructures. They provide the necessary communication, control, data and information required by air traffic controllers, public and private transportation managers and military commanders for the safe and efficient management of assets.

Information Products Group

The Information Products Group delivers essential land information products and services. Land transactions, land use management, resource exploration, disaster monitoring, and similar applications require essential information about ownership, encumbrances, assessed values, location, natural occurrences, trends and environmental characteristics of land.

Over the last three years, MacDonald Dettwiler has invested in internal systems development, alliances and partnerships to create an Information Products Group that serves customers in the real estate, financial, insurance and legal sectors.

MacDonald Dettwiler is applying its experience in digital infrastructure and airborne imaging technologies to develop sophisticated systems for land-related data collection, information extraction and integration, storage and delivery. MacDonald Dettwiler 's Information Products Group 's long term objective is to provide "everything a customer needs to know about a parcel of land ", on a business-to-business basis. The InformationProducts Group provides products and services in the following key areas:

- BC OnLine provides electronic online access to a number of government land-related databases in British Columbia.
- 1 LandMDA, which is to be piloted in a heavily populated state in the United States later this year, will provide near real-time legal, ownership and encumbrance information, critical to accelerating the mortgage and home equity loan approval process.
- DataQuick provides proprietary asset valuation, appraisal and taxation data covering over 80% of the metropolitan population in the United States, which is accessible online and over the Internet.
- Cartica provides a one-stop Internet storefront with a broad selection of digital maps, images and supporting information, addressing the full spectrum of geographic information needs of business, government and professional end-users in the United States.
- Triathlon is the Company's digital aerial mapping group and RADARSAT International is its satellite imaging subsidiary. They provide satellite and aircraft-based mapping and high-resolution imagery and value-added imagery-based products.

MacDonald Dettwiler has a track record of delivering these systems on time and on budget to customers in over 30 countries around the world, many of whom have bought multiple systems from the Company for different applications. The Company employs leading geospatial, imaging, database, E-commerce and space technologies to establish a technically competitive advantage. The Company has proven project management, systems engineering, software development quality control, cost and scheduling methodologies and processes to ensure customer satisfaction and competitiveness.

With a head office in Richmond, B.C., MacDonald Dettwiler employs 1700 people around the world through a network of offices, subsidiaries, and distributors.

MARSH CANADA LIMITED/MARSH INC.

Overview

Marsh Canada is part of a global group known as Marsh & McLennan Companies, Inc. (MMC). The subsidiaries of MMC are **Marsh Inc.**, **Mercer Consulting Group, Inc.** and **Putnam Investments, Inc.**

MMC comprises some 55,000 employees, serving clients in over 100 countries. Marsh Inc. is the largest risk management and insurance brokerage in the world, with premiums placed in excess of \$40 billion (U.S.)

Marsh Canada serves more large clients than any other Canadian Brokerage. It has many specialty practices including those of construction, marine and energy. These will position our professionals to provide both domestic and international assistance to Iter, should Canada be chosen as the host country for this dynamic initiative in fusion power development.

Marsh Canada Limited – A Partner to Iter

The principal obstacles to Iter and business in general today are the growing, increasingly complex risks that prevail in the world's changing economies and societies.

Identifying and managing these exposures is key to unlocking the power of Iter's potential and capitalizing on their opportunities.

Marsh not only can help identify and quantify risks, but also can bring them under control by creating and implementing customized solutions employing the most effective blend of risk mitigation, risk transfer, and advanced risk financing.

These solutions go beyond traditional property-casualty insurance programs to encompass strategies that can help increase efficiency in prudently managing Iter's finances.

Dialogue	Our way of working together to identify risks, and values. We probe deeply and listen -- then systematically apply expertise and techniques tailored to the priorities we define.
Innovation	A culture of innovation is reflected in our history of developing new solutions to emerging client exposures, pioneering new ways of transferring and financing risk, and creating new markets when risk capital has been insufficient to meet client needs.
Global offices	The industry's most owned-and-operated offices around the world combined with specialty practices provide an unrivaled framework for delivering seamless global service to clients.
Specialist resources	Our specialty practices are organized by client industries, which includes embedded solutions specific to each field of business, and by the major categories of risk common to all businesses. The professionals within these industry and risk practices operate on a worldwide basis, linking closely with local offices, to deliver highly focused expertise when and where it is needed.
Client practices	Our client specialty practices focus on specific categories of clients: small, mid-size, and large organizations; affinity groups; insurance companies; and Japanese multinational corporations. This assures each client receives customized attention and service.
Strategic consulting services	A corps of consultants, the industry's largest, and specialized technology provide unmatched resources for identifying, valuing and bringing risks under control.
Risk transfer, risk financing	Our leadership in risk transfer, risk financing, and captive management provides clients with an unparalleled menu of options for dealing with the total spectrum of exposures.
Technology	The industry's most sophisticated network and information infrastructures. We provide unparalleled global communications and information access, as well as a wide range of technology-based risk management tools.
Broad business resources	Through our parent, Marsh & McLennan Companies (MMC), we provide access to the powerful capabilities of Mercer Consulting Group and Putnam Investments.
Employee benefit services	We develop and deliver benefit programs that help our clients attract and retain talented employees.

These capabilities are Marsh's proven credentials to act as a major contributor for the delivery of our construction and operating phase commitments.

Specialty Services

Not only is there specialization between all the business practices within the Marsh McLennan Group of companies, but also Marsh's critical mass has allowed it to provide many specialty services, most of which can respond to Iter's needs.

Service	Description
Aviation	Commercial airlines, military aircraft operation, manufacturers of aircraft and spacecraft, all associated aerospace industries, the space-vehicle launching industry, and corporate aircraft fleets. Placement of owned and non-owned aircraft liability insurance.
Boiler & Machinery	Works in conjunction with other departments in providing engineering and loss prevention support and also placement of Boiler & Machinery insurance program.
Claims	Claims management and intervention on behalf of the client.
Construction, Mining and Energy	Marsh serves the largest client base in these sectors.
Credit/Political Risk	Protection for companies investing in or trading with politically or economically unstable countries.
Directors' & Officers' (D&O)	There is a national resource network on D&O issues, which facilitates the dissemination of information and co-ordination of expertise
Marine	Providing marine placement and advice in all aspects of marine transportation and associated risks.
Marsh Risk Consulting (MRC)	Expertise in a wide range of consultative services, with strategic risk consulting
Risk Management Financial Services (RMFS)	Provides specialist financial advice in structuring self-insurance and risk financing programs.
Surety	Arranging third-party financial guarantees.
U.S. Workers' Compensation	Specializing in U.S. primary casualty coverages including U.S. Worker's Compensation

Industry Specialization Projects

Marsh has a strong commitment to service. We formed industry specific groups in order to concentrate our expertise. We have international, as well as national construction groups. In the Toronto office alone, Risk Management Unit A is dedicated specially to Construction, Mining and Energy. The team has worked on some of the largest projects in the World. A short sampling of our unit A team expertise follows:

Marsh Project Expertise

Minto Developments	Prince Arthur Court, Toronto	\$60,000,000
Trizec Hahn	Banker's Hall, Calgary	\$280,000,000
Trizec Hahn	Academy Awards Theatre, Hollywood	U.S. \$300,000,000
	Fashion Outlet of las Cegas, Retail Mall	U.S. \$50,000,000
Trizec Hahn	Brampton Courthouse	\$80,000,000
	University of Michigan	U.S. \$52,000,000
Ellis-Don	Maplex Research Reactor Project	\$130,000,000
Ellis-Don	Qinshan Candu (China)	\$2,500,000,000
AECL	Isotope Production Facility	\$140,000,000 approx.
Ontario Casino Corporation	Niagara Interim Casino	\$300,000,000
Toronto Star	Vaughan Printing Facility	\$400,000,000
Algoma	Algoma Direct Strip Production Facility	\$8,000,000+
Irving Oil	Refinery Expansion	\$2,000,000,000
Clark Oil	Refinery Expansion	U.S.\$2,000,000,000+

Our clients are some of the most influential whether it be in construction or real estate.

Construction Client Base

Bechtel Group, Inc.	Fluor Daniel Inc.	Skanska
Foster Wheeler Corp.	Kajima Corp.	McDermott International, Inc.
ABB Lummus Global, Inc.	Jacobs Sverdrup, Inc.	Raytheon Engineers & Constructors
Stone & Webster	Structure Tone, Inc.	Chicago Bridge & Iron Co.
Hoffman Corp.	The Turner Corp.	Dillingham Construction Holdings, Inc.
H.B. Zachry Co.	ARB Inc.	BE&K, Inc.
The Austin Co.	Kitchell Corp.	The Perini Corp (Benefits only)
The IT Group	Ellis-Don	Bracknell Corporation (The State Group)
Comstock	AECL	K-Line Maintenance & Construction
Lafarge Corporation	Minto Contruction	Maple Engineering & Construction

OSLER, HOSKIN & HARCOURT LLP

For more than a century Osler, Hoskin & Harcourt LLP has been one of Canada's leading law firms. Our 330 lawyers are based in offices in Toronto, Ottawa, Calgary and New York.

We are focused on providing the highest level of service to Iter Canada and to the Iter Parties in the areas of their greatest interest and need, namely advice on matters of international law, construction, licensing, environmental and related regulatory matters and intellectual property rights.

Osler, Hoskin & Harcourt LLP advises many of Canada's leading corporations as well as U.S. and international parties with extensive interests in Canada. The 2000 *Lexpert/American Lawyer Guide to the Leading 500 Lawyers in Canada* cites the firm as one of the two market leaders in Toronto for executing transactions. In addition to key practices in business law, litigation and tax, we have developed highly specialized areas to respond to the increasingly complex legal issues faced by our clients.

Details of the relevant practice areas of our firm are set below.

International Business Law

Osler, Hoskin & Harcourt LLP actively provides a broad range of legal services to a highly diverse international clientele. Clients outside of Canada often seek guidance on Canadian acquisitions and investments. Corporate, taxation and securities laws and trade and competition regulations present intricate challenges to international business operations. We have assisted international investors in the acquisition of Canadian assets and enterprises, international banks and financial institutions in financing Canadian projects and undertakings, international brokerage houses in placing stock issues in Canada and foreign governments in the privatization of national enterprises.

Osler's has advised clients on international legal and regulatory assignments. Its United States, Latin American, Asian and European practice groups operate on a firm-wide basis to provide focussed, professional teams tailored to the specific requirements of the assignment. Osler's team of lawyers, with the requisite regional and international experience, offer clients technical expertise in areas such as telecommunications, competition, regulation and litigation. Our offices are not only linked by leading-edge communications systems to provide seamless service between regions and time zones, but we can also offer legal services in English, French and 23 other languages.

Energy and Natural Resources

Osler's has established a widely recognized and respected practice in the energy and natural resources industry, both in Canada and internationally. Our expertise encompasses



exploration, development, operating, supply and transportation, processing, refining, upgrading, and marketing arrangements. We advise on all aspects of projects and transactions including structuring, tax planning, mergers and acquisitions, bank financing, public and private, debt and equity financing, environmental, regulatory, governmental, commercial, and security issues. We have also advised clients on risk assessment and other planning considerations.

Our diverse client base includes energy corporations, lenders, public and private investors, underwriters and governments. We advise public and private Canadian and foreign energy companies on a wide variety of national and international transactions, including advice about exploration, transporting (shipping and pipelines), pipelines, upgrading, processing and refining facilities, co-generation facilities, sales and marketing arrangements and governmental and regulatory matters.

Oslers also has significant experience and expertise in energy regulatory issues. We appear frequently before the National Energy Board, Ontario Energy Board and other provincial regulators on matters concerning all aspects of their mandates, and which are of critical concern to our clients.

Construction and Infrastructure

Oslers' Construction and Infrastructure Practice Group has extensive experience in transportation, energy and other engineering and infrastructure projects, as well as in co-generation facilities, natural resource projects and environmental systems/technologies. We advise clients on joint venturing and consortiums, public-private partnerships, build operate transfer (BOT) and similar projects, project development, project structuring, risk management, finance, tax, design, construction, performance guarantees, and operations and management issues, both domestically and internationally. Four of our lawyers who provide "front-end" project advice are also professional engineers. Our clients include owners, contractors, developers, construction managers, governmental agencies, engineers, architects, investors and lenders.

Examples of some of our Canadian and international project work include: major toll highway and toll bridge projects in Canada, Israel and South-east Asia; major airport projects; nuclear and cogeneration energy and pipeline projects and a wide variety of development and industrial building projects.

In providing planning advice, contract negotiation services and in drafting project documentation, we emphasize "preventative" structuring, contractual protection and administrative procedures aimed at minimizing project difficulties and disputes. We are also experienced in construction claims, litigation, arbitration, mediation and dispute review board matters.

Intellectual Property

For decades, our accomplished teams of IP experts – including lawyers, patent agents and trade-mark agents – have successfully represented companies in virtually all sectors of the economy. In addition, we act on an agency basis for some of the world's largest legal and intellectual property firms, representing their clients' interests in Canada.

We have advised many businesses in the technology sector, including software developers and Internet-based companies, on a range of intellectual property matters relating to proprietary information, patents, copyrights and trade-marks. We are increasingly providing a wide range of legal services to these companies in licensing and enforcing those rights. We are also very active in a variety of Internet-related issues such as Internet transmission and replication of copyrighted works, linking, metatagging, framing, scraping, gripe sites, and obtaining and objecting to domain names.

Our professionals offer superior legal advisory services in three core strategic areas: obtaining and perfecting the right – through prosecuting patent and trade-mark applications; commercially exploiting the right – through business transactions such as licensing and franchising; and, protecting the right – through IP litigation and other dispute resolution mechanisms. As a result of their diverse and wide-ranging experience, our IP specialists have the ability to provide sound, reliable representation, while offering innovative and leading edge solutions to the evolving business challenges posed by the new economy. Our IP professionals routinely work together with other key practice areas in the firm, including mergers and acquisitions, tax, insolvency and technology.

Public Law and Government Affairs

Our Public Law and Regulatory Affairs lawyers know that, in order to serve the best interests of our clients, it is essential to successfully manage issues with government leaders and policy and decision makers. It is important to have a full understanding of how these political and bureaucratic decisions are made, and the most effective means of ensuring a positive outcome on behalf of our clients.

Many of our clients operate in sectors of the economy that are subject to federal government regulation. We provide advice in areas such as agriculture, energy, competition, procurement, culture, trade, telecommunications, financial institutions, privacy, e-commerce, health products and pharmaceuticals. Where the Canadian government plays a significant role, our lawyers have experience assisting clients manage their interests.

We have earned a solid reputation for successfully navigating a complex and often politically sensitive government policy or regulatory environment. Federal government decisions typically feed back into an environment of ongoing policy development that can affect federal policies and priorities. Assisting our clients in managing their government relations needs typically involves the monitoring and gathering of strategic government

policy or regulatory information on an ongoing basis. Once the information is compiled, we provide our clients with an analysis of government decisions and policy statements.

Should you wish further information about our firm or its role with Iter Canada, please contact Michael J. Gough at 416-862-6579 or mgough@osler.com.



ROYAL BANK FINANCIAL GROUP

Royal Bank of Canada (“Royal Bank”, the “bank”) is one of Canada's premier financial services institutions, with leading positions in most Canadian markets. It is Canada's largest chartered bank in terms of both market capitalization (C\$28.9 billion at November 1, 2000) and total assets (C\$277.1 billion at August 31, 2000). In all, the bank serves nearly 10 million individual and business customers worldwide. Royal Bank is the third highest credit rated bank in North America and holds long term credit ratings of Aa2 from Moody's and AA- from Standard & Poor's.

In Canada, Royal Bank has leading market shares in most personal and business loan and deposit products. It is Canada's largest money manager and the second largest provider of mutual funds (first among banks) and owns the second largest discount broker, Royal Bank Action Direct, and has by far the largest custody operations. Royal Bank's investment dealer, RBC Dominion Securities, has the highest market share in most of its domestic markets. The bank is also a significant provider of creditor life and disability, individual life and travel insurance. Its domestic delivery network includes more than 1,400 branches and other units, 4,500 bank machines, 270 self-service account updaters, and 87,250 proprietary point-of-sale terminals. With 2.1 million customers, alternative delivery channel provider, Royal Direct, allows access via telephone, the Internet and personal computer.

Internationally, Royal Bank provides corporate and investment banking, trade finance, correspondent banking, treasury and securities custody services to business customers. It also has a retail network in the Caribbean and substantial global private banking operations. The bank's international network includes 99 offices in more than 30 countries.