Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

Canadian Nuclear Safety Commission Safeguards Program Annual Report 2006 - 2007

Canada

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Safeguards Program Annual Report 2006-2007

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Safeguards Program Annual Report 2006-2007

Canadian Nuclear Safety Commission
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Table of Contents

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The Canadian Nuclear Safety Commission (CNSC) has been designated as the federal agency responsible for implementing the agreements between the Government of Canada and the International Atomic Energy Agency (IAEA) for the application of safeguards pursuant to the Nuclear Non-Proliferation Treaty (see box below). In the context of these agreements, this means that the CNSC's Safeguards Program fills the role of Canada's State System of Accounting for and Control of nuclear material (SSAC), which has been established to ensure that Canada fulfils its international obligations to use nuclear energy solely for peaceful purposes. To this end, the CNSC liaises with the International Atomic Energy Agency (IAEA) and regulates the Canadian nuclear industry.

> ***IAEA Safeguards:*** a system of international inspections and other verification activities undertaken by the International Atomic Energy Agency (IAEA) in order to evaluate, on an annual basis, Canada's compliance with its obligations pursuant to the safeguards agreements between the Government of Canada and the IAEA.

This annual report highlights the results of the activities undertaken by the CNSC's Safeguards Program over the 2006-2007 fiscal year (April 1, 2006 to March 31, 2007). The report is structured in four parts. First of all, it outlines the contributions of the Safeguards Program to the CNSC's corporate planning framework, through its five immediate outcomes. Second, it highlights in further detail the activities undertaken in relation to the Safeguards Program priorities, followed by a third section indicating some of the challenges facing the Program in the immediate future. Finally, it summarizes IAEA inspection activities carried out in the 2006-2007 timeframe, along with CNSC participation in these activities.

2006-2007 Program Highlights

The CNSC's Safeguards Program contributed to a number of noteworthy achievements in 2006-2007. Primary among these was the maintenance of the IAEA conclusion that all nuclear material in Canada remained in peaceful activities, as stated in the Agency's 2006 Safeguards Implementation Report. This conclusion, the most comprehensive that can be drawn by the IAEA, was first reached for Canada in 2005 and was the culmination of over five years of extensive effort on the part of the CNSC, the IAEA, and the Canadian nuclear industry. It is based on: (i) the conclusion that all declared nuclear material in the country is for peaceful, non-explosive uses; and (ii) the provision of credible assurance that there is no undeclared nuclear material or activity. Canada is one of only 24 States (out of a total 162) which has received and maintained this conclusion.

The attainment and maintenance of the conclusion allows the IAEA to fundamentally change the way in which safeguards are implemented in Canada, by moving towards an integrated safeguards (IS) approach. The CNSC, in cooperation with the IAEA, has been actively preparing for the implementation of this new regime. The purpose is to enhance the efficiency of IAEA safeguards implementation, without undermining effectiveness. In 2006-2007, an agreement was reached with the IAEA on the implementation of the State-level IS approach (SLA) for Canada, based upon agreed priorities and available resources. On January 1, 2007, implementation of the SLA was achieved for the sector of the nuclear program that includes research reactors and static dry storage facilities. Following this, on March 1, 2007, the SLA was applied to the transfer of spent fuel to dry storage facilities at multi-unit CANDU reactors. The latter achievement was

the culmination of over two years of intensive effort on the part of the IAEA, the CNSC, and affected licensees to address an issue that was consuming a significant portion of the IAEA safeguards resources under the traditional approach.

Directly linked to the application of the SLA to spent fuel transfers at multi-unit reactors was the move towards remote monitoring of surveillance and detection equipment at these facilities, which was officially implemented in January 2007. The transition to remote monitoring represents a significant step forward in the application of safeguards at the power reactors, not only by facilitating the more efficient and effective SLA, but also in reducing the number of IAEA visits required at these facilities.

To date, these implementation changes have not required any additional resources from the CNSC. However, full implementation of the SLA will require enhanced cooperation between the IAEA and the SSAC, which will, in turn, involve new activities for the CNSC.

In March 2006, as part of the CNSC's initiative to establish a site office at AECL's Chalk River Laboratory, a safeguards officer was attached to the office. This is the first time that a safeguards officer has been attached to a CNSC site office.

OVERVIEW

Background

The Treaty on the Non-Proliferation of Nuclear Weapons (often referred to as the Non-Proliferation Treaty, or NPT) came into force on March 5, 1970 and has become the most widely adhered to arms control treaty in history. Article II of the NPT requires every non-nuclear weapon State (NNWS) party to the treaty to undertake not to receive the transfer of, control, manufacture, or otherwise acquire nuclear weapons or other nuclear explosive devices. Under Article III, a NNWS signatory is furthermore required to conclude a safeguards agreement with the IAEA (the "Agency") for the purpose of verifying compliance with the obligations under Article II.

In 1972, Canada became one of the first States to bring into force a comprehensive safeguards agreement (CSA) with the IAEA pursuant to the NPT, followed by the coming of the protocol additional to that agreement (the "Additional Protocol" or AP) in 2000. Together, these two documents provide the basis for the implementation of safeguards in Canada (see text box insert, page 4).

Article 7 of the safeguards agreement requires the establishment and maintenance of a State System of Accounting for and Control of nuclear material subject to safeguards (SSAC). In a broad sense, the SSAC is responsible for providing the IAEA with information and facility access, in accordance with the safeguards agreement and the AP. This translates into a wide variety of practical responsibilities, some of which are summarized in Annex E.

In Canada, the role of the SSAC is carried out by the CNSC, more specifically by the CNSC's Safeguards Program. This designation is consistent with the mandated objectives of the CNSC as described under paragraphs 3(b) and 9(a)(iii) of the *Nuclear Safety and Control Act*. Functionally speaking, the Safeguards Program is administered by two divisions within the CNSC: the International Safeguards Division (ISD) and the Technical Development and Services Division (TDSD), both within the Directorate of Security and Safeguards (see Annex C for the organizational charts for ISD, TDSD, and DSS). In addition, the Non-proliferation and Export Control Division (NPECD) contributes to the Safeguards Program through the gathering of data related to the export and import of certain items subject to the safeguards agreement. The CNSC also manages and funds a research and development program known as the Canadian Safeguards Support Program (CSSP). While the CSSP provides a wide range of support to the IAEA's safeguards regime, the first priority of the program is to address safeguards issues in Canada. A more fulsome description of the activities undertaken by the CSSP is outlined in a separate annual report.

During the 2006-2007 fiscal year, the CNSC's Safeguards Program utilized 12.6 Full-Time Equivalents – 9.35 for ISD and 3.25 for TDSD. During this time period, ISD experienced a number of staffing changes: two senior safeguards advisors retired and five new staff members were hired, including four safeguards officers and one administrative assistant. One of these safeguards officers was attached to the newly-created Chalk River Laboratory CNSC site office, becoming the first safeguards officer permanently stationed at a CNSC site office in Canada.

Mission and Mandate

It is the CNSC's mission to regulate the use of nuclear energy and materials to protect health, safety, security, and the environment, and to respect Canada's international commitments on the peaceful use of nuclear energy. Within this context, the mandate of the Safeguards Program is as follows:

- To provide credible assurance to Canada and to the international community that all declared nuclear material is in peaceful, non-explosive uses and that there are no undeclared nuclear materials or activities in this country;
- To implement the Canada/IAEA Safeguards Agreement and Additional Protocol;
- To contribute to the identification and analysis of new verification issues/challenges and to the development and implementation of safeguards approaches, measures, and procedures to appropriately address those issues/challenges; and
- To provide authoritative advice to the President of the CNSC, the Minister of Natural Resources, and the Government of Canada on the development and application of nuclear non-proliferation and safeguards policy.

The Evolution of Safeguards in Canada

The dawn of the nuclear age introduced an era both of great promise and responsibility. Along with the many peaceful applications of nuclear energy comes the potential threat represented by its misuse for the production of nuclear weapons. This threat requires unprecedented and unanimous commitment to nuclear non-proliferation. For its part, Canada has consistently taken a leading role in promoting and developing the principles of non-proliferation, in both the domestic and international arenas.

Phase 1 – Traditional Safeguards

This term applies to IAEA safeguards in Canada implemented in accordance with the comprehensive safeguards agreement (CSA) between the Government of Canada and the IAEA, which came into force in 1972 (pursuant to the requirements of the NPT). The purpose of this agreement was to provide the IAEA with the means to verify, through physical inspections and data analysis, that all *declared* nuclear material in Canada remained in peaceful uses and was not diverted to nuclear weapons or other nuclear explosive devices.

Phase 2 – Strengthened Safeguards

The discovery of Iraq's clandestine nuclear weapons program in 1990 led to a reassessment of the effectiveness of the global safeguards regime. Under traditional safeguards, a State declares its nuclear material and activities and the IAEA verifies this declaration. This assumes, however, that the State has submitted a complete declaration and does not have any clandestine nuclear material or activities. Post-1990 it was recognized that the scope of safeguards should be strengthened to include the *credible assurance of the absence of undeclared nuclear material and activities.* To that end, the Protocol Additional to the Safeguards Agreement (commonly referred to as the Additional Protocol or AP) was created in 1997 and required States to provide more information on their nuclear activities as well as increased access to locations within the country. Canada was intimately involved in the development of these strengthening measures and was a forerunner in their implementation, signing the AP in 1998 and bringing it into force in 2000.

Phase 3 – Integrated Safeguards

Since 2000, the IAEA has been implementing the safeguards agreement as well as the Additional Protocol in Canada with the ultimate goal of reaching a broad conclusion for Canada based on the objectives of both of these documents: that all nuclear material declared by Canada was accounted for and was used solely for peaceful, non-explosive purposes, and that there is credible assurance of the absence of *un*declared nuclear materials or activities in Canada. After five years of extensive effort, in September 2005, the IAEA drew the broad conclusion for Canada. On the basis of this conclusion, the Agency can introduce a fundamental change to safeguards implementation in Canada, aimed at optimization. This new system is called integrated safeguards. The main elements of such an approach are as follows:

1. Implementation is dependant upon considerations particular to a given State. In Canada's case, these considerations are both non-technical (e.g. a long-standing commitment to nuclear non-proliferation) as well as technical (e.g. a natural uranium fuel cycle stretching from mining to the storage of spent fuel and the presence of an IAEA regional office in Toronto);
2. Regular, scheduled inspections will be replaced by a smaller number of unannounced or short notice inspections; and
3. Safeguards accountancy and operational information will be provided to the IAEA on a near-real time basis.

Table 1: Safeguards Program priorities and link to CNSC strategic outcomes

Priority	Activities	Immediate Outcome				
		1	2	3	4	5
Effectively implement the Canada-IAEA safeguards agreements	Continue efforts required to maintain IAEA's broad conclusion for Canada		x			
	Conduct Working Level Meetings with licensees and/or IAEA to discuss issues of safeguards significance					x
	Complete annual update to Canada's declaration under the Additional Protocol		x			
	Assist licensees in creating or revising DIQs		x			
	Develop safeguards regulations and associated documents	x				
	Participate in Commission hearings	x				
	Contribute to CMDs and other licence reviews of safeguards significance		x			
	Participate in Canada-Agency Safeguards Implementation Consultations & associated working level meetings			x		
Effectively implement CNSC's nuclear material accounting (NMA) program	Complete CNSC regulatory standard S-336	x				
	Enhance CNSC's nuclear material accounting system (NMAS)		x			
	Audit licensees' nuclear material accounts			x		
	Reconcile licensee accounts with CNSC accounts			x		
	Prepare accounting reports for IAEA			x		
Contribute to the conceptualization, development, and implementation of strengthened IAEA safeguards	Consult with IAEA on transition to integrated safeguards (IS)	x				
	Establish necessary processes & procedures for implementing IS	x				
	Consult with IAEA on revised measures related to the verification of starting point of safeguards in Canada		x			
	Participate on the IAEA Director-General's Standing Advisory Group on Safeguards Implementation (SAGSI)				x	
	Participate in technical consultations and field trials				x	
Strengthen national capability to provide independent assurance of safeguards objectives	Consult with DFAIT, NRCAN, PCO, TB & IAEA	x			x	
Continue outreach program with stakeholders	Consult with industry on IS, safeguards regulations, and S-336					x
Provide timely and accurate advice to CNSC, DFAIT, and VPERM on matters pertaining to safeguards and safeguards implementation	Consult regularly with departments referenced				x	
	Contribute to Canadian positions at IAEA General Conference and Board of Governors				x	
	Participate in Committee on Safeguards & Verification				x	
Contribute to efforts to provide technical support for the IAEA/CNSC verification program	Contribute to development and implementation of remote monitoring		x			

PART I – CONTRIBUTION TO CNSC CORPORATE FRAMEWORK

The CNSC uses a strategic framework for planning, monitoring, and reporting. The reporting of the CNSC's performance against its plans is structured in terms of the following five immediate outcomes:

1. A clear and pragmatic regulatory framework;
2. Individuals and organizations that operate safely and conform to safeguards and non-proliferation requirements;
3. High levels of compliance with the regulatory framework;
4. CNSC cooperates and integrates its activities in national/international nuclear fora; and
5. Stakeholders' understanding of the regulatory program.

Underlying the CNSC's strategic framework is its management and enabling infrastructure, which enables the CNSC to perform the necessary activities to meet the requirements of good governance with a high level of accountability.

In 2006-2007 the CNSC's Safeguards Program continued to contribute to these strategic outcomes in the pursuit of the Program's priorities. The table on the left page outlines these priorities and the corresponding links to the five immediate outcomes.

PART II – SAFEGUARDS ACTIVITIES

1. Effectively implement the Canada-IAEA safeguards agreements

Broad Safeguards Conclusion

In 2005, after five years of extensive effort from the CNSC and the IAEA, the Agency reached the broad conclusion for Canada that all declared nuclear material was accounted for and was used solely for peaceful, non-explosive purposes, and that there are no undeclared nuclear materials or activities in Canada (see text insert).

In 2006, Canada achieved gold star status as one of only 24 States worldwide for which the broad conclusion was maintained by the IAEA, subsequent to its initial achievement (eight additional States achieved the conclusion for the first time in 2006). Maintaining the conclusion requires not only the ongoing implementation of measures related to the Canada-IAEA safeguards agreements, but also the resolution of historical issues that predate the existence of IAEA safeguards in Canada.

Deriving Safeguards Conclusions

The following text is taken from the IAEA's 2006 Safeguards Implementation Report (SIR) and describes the basis for drawing the two components of the broad safeguards conclusion (italics added):

To conclude that there is *no indication of diversion of declared nuclear material from peaceful nuclear activities* in a State, the [IAEA] carries out a comprehensive evaluation of all information available to it. This encompasses the information provided by the State with regard to the design and operation of declared nuclear facilities, the State's nuclear material accounting reports and the results of the [IAEA's] inspections carried out in order to verify the State's declarations. In addition, the [IAEA] evaluates the information acquired through the implementation of the State's additional protocol.

To conclude that there is *no indication of undeclared nuclear material and activities* in a State, the [IAEA] carries out an evaluation of the consistency of the State's declared nuclear programme with the results of its verification activities under the relevant safeguards agreement and additional protocol and with all other information available to the Agency.

CASIC

The Canada-Agency Safeguards Implementation Consultation (CASIC) mechanism, which began in 1980, is an essential element for ensuring compliance with the Canada-IAEA safeguards agreements. There are traditionally two CASICs held during the calendar year: one in Ottawa and one in Vienna. In the 2006-2007 fiscal year, due primarily to staffing changes at the IAEA, only one such meeting was held (28-29 November 2006, in Vienna). Five CNSC Safeguards Program staff members were in attendance (four from ISD, one from TDSD). Topics covered included: the transition to the State-level integrated safeguards approach, including an agreed implementation work plan; State and IAEA reporting; safeguards equipment issues; measures related to the implementation of the Additional Protocol; the results of SIM-PIV 2005; and updates on current and proposed directions of the IAEA Secretariat. Immediately prior to this CASIC, a number of working level meetings were held with the IAEA (see next section).

Working Level Meetings

In the course of implementing safeguards in Canada the CNSC's Safeguards Program engages in numerous working level meetings with the IAEA, licensees, or both to discuss a wide variety of safeguards issues. Table 2 summarizes the working level meetings held in the past fiscal year.

Table 2: Working Level Meetings held in fiscal year 2006-2007

Date	Participants	Topic
May 2006, June 2006, July 2006, September 2006, November 2006, February 2007	IAEA, Bruce Power, OPG	State-level integrated safeguards approach for multi-unit CANDU stations
April 2006	IAEA, AECL-CRL	Nuclear material accounting processes and practices
May 2006	IAEA, Cameco Blind River, Cameco Port Hope, Zircatec, GE Peterborough, GE Toronto	Conceptual State-level integrated safeguards approach for conversion & fuel fabrication facilities
June & September 2006	IAEA, OPG-Darlington	State-level integrated safeguards approach for new waste management facility on the Darlington site
September 2006	IAEA, OPG-Pickering	Safeguards approach during de-fuelling of Pickering U-2
November 2006	IAEA	Facility-specific integrated safeguards procedures; current challenges related to the safeguards program at AECL Chalk River; and improvements to the Canadian Nuclear Material Accounting System (NMAS)
November 2006	Zircatec	Safeguards accountancy issues associated with the manufacture of low enriched fuel bundles (promotional compliance)
January 2007	IAEA, AECL-CRL	Review and prioritization of safeguards projects at CRL
February 2007	IAEA	State-level integrated safeguards approach for conversion and fuel fabrication facilities (video conference)
March 2007	IAEA, AECL-CRL	Accounting process for historical waste at CRL
March 2007	IAEA	State-level integrated safeguards approach for conversion and fuel fabrication facilities; discussion of measures related to the starting point of safeguards (at Cameco Blind River)

Annual Update to the Additional Protocol Declaration

Under the Additional Protocol, the CNSC is required to submit an annual declaration to the IAEA regarding Canada's nuclear fuel cycle, by May 15th of every year. The declaration includes, *inter alia*:

- information on nuclear fuel cycle-related research and development;
- site descriptions for nuclear facilities under safeguards;
- annual production capacities of uranium mines; and
- general plans for the succeeding ten-year period relevant to the development of the nuclear fuel cycle.

The information filed under the Additional Protocol declaration is intended to provide the IAEA with a fuller and clearer understanding of the nuclear activities in Canada, and contributes to the Agency's ability to draw an annual conclusion on Canada's nuclear fuel cycle. Information is gathered from over 30 members of the nuclear industry, covering the entire natural uranium fuel cycle, research facilities, and manufacturers of certain nuclear-related products. ISD staff typically spends nearly 330 hours over six months reviewing, revising, and compiling the information, which must then be re-formatted using software provided by the IAEA prior to submission. This work represents a significant use of the CNSC's Safeguards Program resources every year.

The CNSC submitted the 2006 update to Canada's declaration (covering the calendar year) under the Additional Protocol on 11 May 2007, four days before the annual deadline.

Facility Design Information

A fundamental component of safeguards implementation in Canada is the Design Information Questionnaire (DIQ), a document prepared by safeguarded facilities containing information concerning nuclear material subject to safeguards, as well as the features of those facilities relevant to safeguarding such material. DIQs are used by the IAEA to design the facility safeguards approach and establish key measurement points, for the purposes of inventory and flow verification. DIQs are living documents that are updated periodically to reflect any safeguards-relevant changes to a facility. The CNSC's Safeguards Program monitors the status of Canadian DIQs, assists licensees in the preparation and revision of these documents, and submits the final versions to the IAEA.

During the past year, there was an intensive push to update facility design information: an unprecedented eleven DIQs were examined and submitted to the IAEA (see Table 3); an additional five DIQs are currently under CNSC review prior to submission, while ten are being prepared or revised by licensees.

Table 3: Design Information Questionnaires submitted in 2006-2007

Facility	Date Submitted
Western Waste Management Facility	April 12, 2006
Cameco Blind River	May 5, 2006
Darlington Waste Management Facility	December 20, 2006
AECL Chalk River Labs (Fuel Packaging and Storage)	January 22, 2007
AECL Chalk River Labs (Waste Management Area)	January 23, 2007
AECL Chalk River Labs (NRU)	February 14, 2007
AECL Chalk River Labs (Dedicated Isotope Facility)	February 28, 2007
AECL Chalk River Labs (NMC)	February 28, 2007
Bruce Nuclear Generating Station 'A'	March 29, 2007
AECL Chalk River Labs (Fuel Fabrication)	March 30, 2007
AECL Chalk River Labs (Fuel Fabrication)	March 30, 2007

Safeguards Regulations

In 2006-2007 the CNSC continued to work on new *Nuclear Safeguards Regulations* to clarify and consolidate measures to be undertaken by licensees to meet the requirements of the Nuclear Safety and Control Act and the safeguards agreements between Canada and the IAEA.

A new requirement, introduced in July 2006, was the submission to Treasury Board Secretariat of a completed Triage Questionnaire, to facilitate categorization of the relative importance of all federal regulatory proposals. Considerable effort was required to co-ordinate activities within the CNSC and to obtain the appropriate approvals, in order to satisfactorily complete the process for the *Nuclear Safeguards Regulations.* Work on the development of drafting instructions is now in progress.

Commission Member Documents and Corporate Reports

The CNSC's Safeguards Program contributes regularly to the preparation of Commission Member Documents (CMDs) related to licensing activities. Over the fiscal year, eleven CMDs of safeguards relevance were reviewed, and Safeguards Program staff attended 25 Commission hearings, including two off-site hearings in Port Hope and Bécancourt.

Throughout the course of the past year, the Safeguards Program also contributed to numerous other corporate documents, including the Report on Plans and Priorities, the CNSC's 2005-2006 Annual Report, and the annual Power Reactor Industry Report.

2. Effectively implement CNSC's nuclear material accounting (NMA) program

CNSC Regulatory Document RD-336

Since June 2004, extensive effort has been expended in the formation of a new CNSC regulatory document (RD-336), entitled "CNSC Reporting Requirements for Nuclear Materials", which will replace the previous AECB 1049 Rev. 2 reporting requirements. An internal review of this document was initiated in September 2006, after which it was sent for public comment in November 2006. The comments received were dispositioned by the end of the reporting period.

Nuclear Material Accounting System (NMAS)

The CNSC's Safeguards Program manages an electronic system for maintaining a national system of accounts for nuclear material based on accountancy records received from licensees, known as the Nuclear Material Accounting System (NMAS). During the 2006-2007 fiscal year a number of enhancements were made to NMAS to improve its functionality. The Phase 1 feasibility study for the project – aimed at accommodating electronic submissions from licensees – was completed.

Nuclear Materials Accounting

Licensee nuclear material accounts were reconciled with the national system of accounts in NMAS on a monthly basis, and closed on an annual basis, as part of the Physical Inventory Verification (PIV) exercises. No significant accounting issues arose from this process. All required accounting reports were dispatched to the IAEA, as summarized in Table 4. This includes the monthly Inventory Change Reports (ICR), and the annual Physical Inventory Listing (PIL) and Materials Balance Reports (MBR). The IAEA has confirmed that all Materials Balance Reports, which compare the amount of nuclear material recorded on a facility's ledgers with the amount physically present at the facility, were acceptable.

Table 4: Nuclear material accountancy reports submitted to the IAEA

Report Type	Number of Reports Submitted	Number of Report Lines
ICR	324	7,973
PIL	38	8,242
MBR	37	806
Total	**399**	**17,021**

In March 2007, members of TDSD and ISD met with representatives of the IAEA to discuss a new accounting principle for making corrections, called the Virtual Replacement Correction Principle. The need to carefully coordinate the transition to this method between the two organizations was emphasized. Trials are expected to begin at the end of 2007, with the intention for the CNSC to implement this principle in 2008.

3. Contribute to the conceptualization, development, and implementation of strengthened IAEA safeguards

Integrated Safeguards Implementation

In working towards the implementation of the State-level integrated safeguards approach, the CNSC has engaged in a number of working group meetings (as summarized above). Resources have been allocated according to the order of implementation priority agreed to between the IAEA and the CNSC, as follows:

(i) transfers of spent fuel to dry storage at multi-unit CANDU stations;
(ii) fuel cycle sector comprised of static dry storage facilities and research reactors;
(iii) multi-unit CANDU stations (excluding spent fuel transfers);
(iv) bulk handling facilities;
(v) single-unit CANDU stations; and
(vi) Chalk River Laboratories.

After extensive effort from all parties involved, an integrated safeguards approach was successfully implemented for the first two items on this list of priorities: on March 1, 2007 for spent fuel transfers at multi-unit stations, and on January 1, 2007 for static dry storage facilities and research reactors. The implementation of an IS approach for spent fuel transfers was a particularly noteworthy achievement, representing the culmination of over two years of intensive effort on the part of the IAEA, the CNSC and affected licensees, to address an issue that was consuming a significant portion of the IAEA safeguards resources under the traditional approach.

The development of an integrated safeguards approach for the multi-unit CANDU stations (excluding spent fuel transfers) and for the natural uranium conversion and fuel fabrication plants (the so-called bulk handling facilities) is ongoing; these sectors represent the next two priorities for implementation.

Starting Point of Safeguards

In July 2005, safeguards measures were applied for the first time to Cameco's Blind River refinery and to the front end of Cameco's Port Hope conversion facility. This was in response to a change in IAEA policy that required safeguards to be applied to a point earlier in the nuclear fuel cycle than was previously the case. Subsequent experience with implementing these new measures has revealed some practical difficulties with the agreed approach related to the measurement of receipts at the starting point of safeguards (i.e. the input of uranium ore concentrate to Cameco Blind River). A revised approach for measuring this transaction will need to be developed. To that end, discussions were held during an IAEA/CNSC meeting in Vienna in March 2007. The ultimate goal is to devise a proposal that meets the IAEA's safeguards objectives without causing undue interference in the commercial operations of the Blind River refinery.

SAGSI

At the request of the IAEA Director General, a CNSC staff member from ISD participates on his Standing Advisory Group on Safeguards Implementation (SAGSI), which provides expert advice on the technical objectives and implementation parameters of IAEA safeguards and on the effectiveness and efficiency of specific implementation practices. As of January 1, 2007, this CNSC staff member was appointed as the chair of SAGSI, the first Canadian to hold this position since 1976.

During the 2006-2007 fiscal year two plenary sessions were held by SAGSI to examine, *inter alia*: the further development of the State-level approach to safeguards implementation and evaluation; the integrated safeguards approach for geological repositories; the evaluation of safeguards effectiveness and performance; guidelines for State systems of accounting for and control of nuclear material; the IAEA's techniques for information acquisition and analysis; and the safeguards research and development programme.

IAEA Safeguards Symposium

From 16-20 October 2006, the IAEA hosted, at its Vienna headquarters, a symposium on international safeguards, entitled "Addressing Verification Challenges". IAEA safeguards symposia are typically held every four to five years (with the last one taking place in October 2001), and represent a major forum for the discussion of safeguards concepts, approaches, and practices. Approximately 450 participants were registered for the symposium, representing 64 countries and a number of regional and professional organizations, including ABACC, the European Commission, IAEA, ESARDA, and INMM. Both the Director General of the IAEA and the Deputy Director General of Safeguards addressed the symposium, along with other high-level political, regulatory, and industry representatives.

Linda J. Keen, President and CEO of the CNSC, gave a keynote speech during the opening plenary, entitled "*Principles in safeguards: A Canadian perspective*". Key messages of this talk included: the need for openness and transparency on the part of nuclear regulators and the nuclear industry; an emphasis on innovative and risk-informed solutions to safeguards challenges; and Canada's commitment to maintaining the broad safeguards conclusion reached in September 2005 (with a hope that the effort required to maintain this conclusion will be less than that required to achieve it). President Keen also made note of Canada's new focus on the development of a national safeguards authority, which would enhance the CNSC's capability to assure the Canadian public that all Canadian nuclear material is being used for peaceful purposes only.

In addition to President Keen's keynote address, there were other significant Canadian contributions to the symposium, including three presentations by members of ISD and six by contractors sponsored by the CSSP.

The Canadian messages were well-received by the symposium participants, with special mention during the closing plenary of a number of key points from President Keen's speech, including Canada's goal of maintaining the broad safeguards conclusion, and the need for regulators to model and emulate good practice in a culture of compliance.

Institute for Nuclear Materials Management Annual Meeting

The 47th annual meeting of the Institute for Nuclear Materials Management (INMM) was held 16-20 July 2006, in Nashville, Tennessee. With 953 attendees and 361 papers presented, it was the largest INMM conference ever held. The conference touched on: (i) advances in safeguards concepts, approaches, techniques and technologies; (ii) the application of safeguards in other countries; and (iii) the political dimension of international nuclear non-proliferation efforts. It also provided a valuable opportunity to meet and network with members of the IAEA, SAGSI, representatives from other SSACs, and various safeguards experts. The CNSC's Safeguards Program was well represented, with a total number of five papers.

4. Strengthen national capability to provide independent assurance of safeguards objectives

During the fiscal year 2006-2007, the CNSC's Safeguards Program continued to work towards the development of an effective national verification program that focuses on regulatory compliance with domestic requirements for nuclear material control, and which also complements the CNSC's efforts to discharge its responsibilities for implementing the safeguards agreements between Canada and the IAEA. To that end, the Safeguards Program initiated interdepartmental discussions on this initiative and began work on defining the requirements and seeking commensurate resources for a National Safeguards Authority (NSA).

5. Continue outreach program with stakeholders

As part of the CNSC's corporate Outreach Program, the Safeguards Program is committed to an agenda of transparent communication and consultation with stakeholders, with the goals of improving familiarity with existing safeguards measures and introducing licensees to emerging approaches. The table below illustrates the outreach activities held during the period under review.

Table 5: Outreach activities held in fiscal year 2006-2007

Date	Licensee	Topic
October 2006	Bruce Power and OPG-Western Waste	ISD staff met with Bruce Power and OPG-Western Waste to review their respective Safeguards Programs
November 2006	Zircatec	ISD and TDSD staff held a meeting at Zircatec to discuss safeguards accountancy issues
February 2007	OPG-Darlington	ISD staff conducted a seminar at the Darlington NGS to introduce safeguards concepts to new staff

6. Provide timely and accurate advice to CNSC, DFAIT, and VPERM on matters pertaining to safeguards and safeguards implementation

During the 2006-2007 fiscal year, ISD provided background briefings on safeguards to the Canadian Delegation to the IAEA General Conference in September, and participated within the delegation for the negotiation of the annual General Conference resolution on safeguards. ISD also provided support to the Canadian delegation to the IAEA Board of Governors (BOG) meetings throughout the year, on issues pertaining to safeguards and safeguards implementation. Of particular importance in this regard was the June BOG meeting, which traditionally focuses on safeguards issues, including the IAEA's annual Safeguards Implementation Report (SIR). Finally, ISD supported the work of the IAEA Committee on Safeguards and Verification (CSV), which was mandated to consider ways to strengthen the safeguards system and which held three meetings during the year.

ISD played a central role in supporting the Canadian delegation in the discussions on a possible Fissile Material Cut-off Treaty (FMCT) within the Conference on Disarmament (CD) in Geneva. In particular, ISD contributed to the development of a Canadian position paper concerning the possible scope of and verification pursuant to an FMCT for discussions within the CD in March, 2007.

At the request of the IAEA, an ISD representative participated as a lecturer in the Regional Training Course on Implementation of State Systems of Accounting for and Control of Nuclear Materials held in Buenos Aires in March, 2007.

7. Contribute to efforts to provide technical support for the IAEA/CNSC verification program

Remote Monitoring

Through the CSSP, assistance was provided to the IAEA to implement remote monitoring of IAEA equipment installed at Canadian facilities. This included developing and installing upgrades to the software and firmware for the bundle counters and core discharge monitors used in safeguarding CANDU reactors. The application of remote monitoring not only provides the IAEA with a near-real time picture of the situation at Canadian reactors, but also removes the need for quarterly visits to these facilities in order to download data. It was furthermore seen as a prerequisite for the implementation of the IS approach for spent fuel transfers to dry storage at the power reactors, and was thus instrumental in achieving this milestone.

PART III – FUTURE CHALLENGES

The Safeguards Program continues to operate in a very dynamic environment, at a time of significant change at both the national and international level. Some of these changes will present challenges to the Safeguards Program that will need to be successfully addressed to ensure effectiveness.

At the national level, work continues with both the Agency and the nuclear industry to develop the procedures for the implementation of the State-level integrated safeguards approach at the front end of the natural uranium fuel cycle. This includes the processing facilities such as refinement, conversion and fuel fabrication, as well as the fresh fuel storage areas of the nuclear power reactors. Furthermore, work is required on the development of procedures for multi-unit power reactor facilities, for the single-unit power reactor facilities, for transfers of irradiated fuel at the single unit power reactors, and for the Chalk River Research Laboratory. Completion of these tasks will lead to the full implementation of the State-level integrated safeguards approach for Canada. Once this goal is achieved, further effort will be required to monitor, refine and improve the approach, as experience is gained and as new technologies are developed. Accordingly, the quest for maximizing safeguards efficiency, while maintaining safeguards effectiveness, will continue.

The implementation of the State-level integrated safeguards approach is dependent upon the IAEA's ability to maintain the broad safeguards conclusion for Canada. This, in turn, will require the continued successful implementation of the Canada/IAEA safeguards agreements. The CNSC's Safeguards Program is focused on ensuring that this objective is consistently attained. One essential element of this effort is to ensure that there is an appropriate regulatory framework to provide assurance to Canadians, as well as the international community and the IAEA, that nuclear material in Canada is properly accounted for and that it is being used solely for peaceful purposes. Another essential element is to ensure that Canada's SSAC meets the international standards established by the IAEA. This latter point is particularly important, as current concepts for optimizing safeguards efficiency under State-level integrated safeguards approaches envisage enhanced cooperation between the IAEA and SSACs.

In addition to the ongoing work on the State-level integrated safeguards approach and on the successful implementation of the Canada/IAEA safeguards agreements, the very real prospects of a nuclear renaissance in Canada and in other countries will present new challenges to safeguards implementation. In Canada, efforts have begun with respect to the refurbishment of some of the existing nuclear power reactors, and new power reactors are being contemplated. Moreover, new uranium mines and associated facilities may be needed to replace aging infrastructure and ramp-up production, in order to meet future demand. In addition to bringing new facilities and new nuclear material under safeguards, these initiatives could have a significant impact on the Safeguards Program, particularly if they involve new technologies.

At the international level, it is imperative that the IAEA safeguards system remains effective and is efficiently implemented. The system continues to change as a result of the verification challenges that it encounters and the lessons learnt from those experiences. Concepts, approaches and measures which were the basis of the original safeguards system are changing. This, in turn, will require fundamental changes in safeguards culture – a move away from uniformity to a more focused and adaptable safeguards system, which continues to provide confidence in the various safeguards conclusions drawn by the IAEA. Through the CNSC's Safeguards Program, and with the assistance of the CSSP, Canada will continue to contribute to efforts to appropriately strengthen the international safeguards system.

PART IV – IAEA INSPECTION ACTIVITIES

A fundamental component of the international safeguards system is the verification of information provided by the State. The IAEA has a number of different tools at its disposal to carry out this function, including inventory verifications, unannounced or short notice inspections, and complementary access visits. These activities, described below, are carried out at "facilities" and "locations outside facilities" (or LOFs), which are IAEA terms applied to installations of a certain type (i.e. reactors, conversion plants) or possessing a certain quantity of nuclear material.

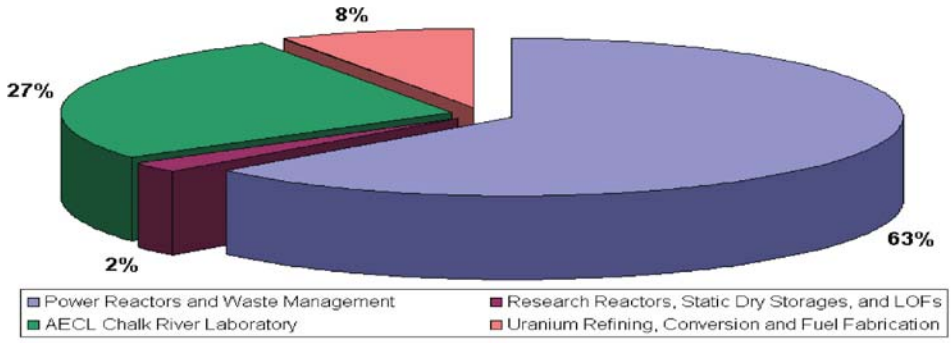
1. Inspection effort

The IAEA measures its inspection efforts through a unit of measurement called person-days of inspection (PDIs), which is essentially the number of inspectors involved in an inspection multiplied by the duration of the inspection, in days. In the 2006-2007 fiscal year, the IAEA expended 1,010 PDIs in Canada (see Table 6). The breakdown of the IAEA's inspection effort by fuel cycle sector is shown in Figure 1.

Table 6: IAEA PDIs by facility type

AECL CHALK RIVER LABORATORY	
Unirradiated material storage	61
NRX reactor	2
Dedicated isotope facility	7
NRU reactor	58
Fuel fabrication	66
Spent fuel storage	38
Spent fuel canister storage	6
Fuel fabrication facility	2
Spent fuel storage	22
Biology, chemistry, physics labs	6
URANIUM REFINING, CONVERSION, AND FUEL FABRICATION	
Cameco Blind River	22
Cameco port hope	36
Zircatec	9
General Electric, Toronto	6
General Electric, Peterborough	9
POWER REACTORS AND WASTE MANAGEMENT FACILITIES	
Darlington NGS	32
Bruce "A" NGS	48
Bruce "B" NGS	96
Pickering NGS	105
Gentilly II NGS	99
Point Lepreau NGS	132
Western Waste Management	73
Pickering Waste Management	52
RESEARCH REACTORS, STATIC DRY STORAGES AND LOFS	
Gentilly I Dry Storage	6
Douglas Point Dry Storage	4
Whiteshell Dry Storage	7
McMaster University research reactor	2
MDS Nordion	2
Location outside facility	2
TOTAL	**1010**

Figure 1: Percentage of IAEA PDIs by Sector (for Fiscal Year 2006-2007)



2. Inventory verification activities

The IAEA's inspection effort, as captured by the PDI measurement, is expended in inventory verifications. These are traditionally pre-arranged with the facility and are performed on a routine basis throughout the year. However, under the State-level integrated safeguards approach, the IAEA is increasingly moving towards the use of short notice or unannounced inventory verifications, which utilize the element of unpredictability to reduce the total number of inspections required, while maintaining the same level of confidence in the inspection regime.

Routine inspections

Under the safeguards agreement the IAEA has the right to conduct routine inventory inspections at Canadian nuclear facilities and other locations. These inspections fall under two main categories: physical inventory verifications (PIVs) and interim inventory verifications (IIVs). In the 2006-2007 timeframe, 36 PIVs and 104 IIVs were carried out in Canada (see Table 7). A third category of routine inspection activity – the verification of transfers of spent fuel to dry storage facilities at the power reactors – is not recorded as a separate inspection, although the inspection effort involved is included in the total number of PDIs for those facilities.

Table 7: Routine IAEA inventory inspections carried out in 2006-2007

Facility category	Physical Inventory Verification	Interim Inventory Verification
AECL Chalk River Laboratories	18	78
Uranium refining, conversion, and fuel fabrication	5	6
Power reactors and waste management facilities	8	14
Research reactors, static dry storages, and LOFs	5	6
TOTAL	**36**	**104**

The majority of the PIVs described above are carried out in two major simultaneous exercises every year: one focusing on AECL's Chalk River Laboratories (which is actually broken into two phases based on the nature of the facilities verified) and one covering Canada's natural uranium fuel cycle (including all conversion, fuel fabrication, and power reactor facilities). These simultaneous PIVs, referred to as SIM-PIVs, are significant annual undertakings, requiring extensive resources from the IAEA, the CNSC, and affected licensees.

The 2006 Chalk River SIM-PIV took place over one week in May and three additional days in June, covering a total of 18 facilities on the Chalk River Laboratory site. Altogether, the inspection activities involved two CNSC safeguards officers (consuming approximately 0.05 FTEs) and over ten IAEA inspectors.

The 2006 natural uranium fuel cycle SIM-PIV lasted approximately two weeks (although preparations began at least two months in advance), involved 13 nuclear facilities and three smaller LOFs, and made use of ten CNSC personnel in the field (0.22 FTEs), along with 30 inspectors from the IAEA.

Overall, the two 2006 SIM-PIV exercises went well. In each case, the facilities were well prepared and operator support was excellent. For the most part, the activities proceeded according to schedule and were concluded in the allotted time or earlier.

Short notice and unannounced inspections

The transition to integrated safeguards has introduced the use of unannounced inspections (UIs) and short notice random inspections (SNRIs) at those Canadian facilities for which a State-level integrated safeguards approach has been implemented. As indicated previously, the randomization of inspections under the State-level approach is considered a statistical substitute for the larger number of scheduled inspections required under traditional safeguards. In the 2006-2007 fiscal year, three UIs were carried out for spent fuel transfers to dry storage (the UI regime for these transactions was implemented only one month before the end of the fiscal year). No SNRIs related to integrated safeguards were carried out in this fiscal year.

3. Other IAEA activities

Complementary access

In addition to inventory verifications, the Additional Protocol has extended the access rights of the IAEA to include short notice access – referred to as complementary access (CA) – for the purpose of confirming the absence of undeclared nuclear material and activities. Eleven CAs were carried out in Canada during the 2006-2007 fiscal year (see Annex F for a full list of CAs carried out in Canada since their introduction in 2000).

Design information verification

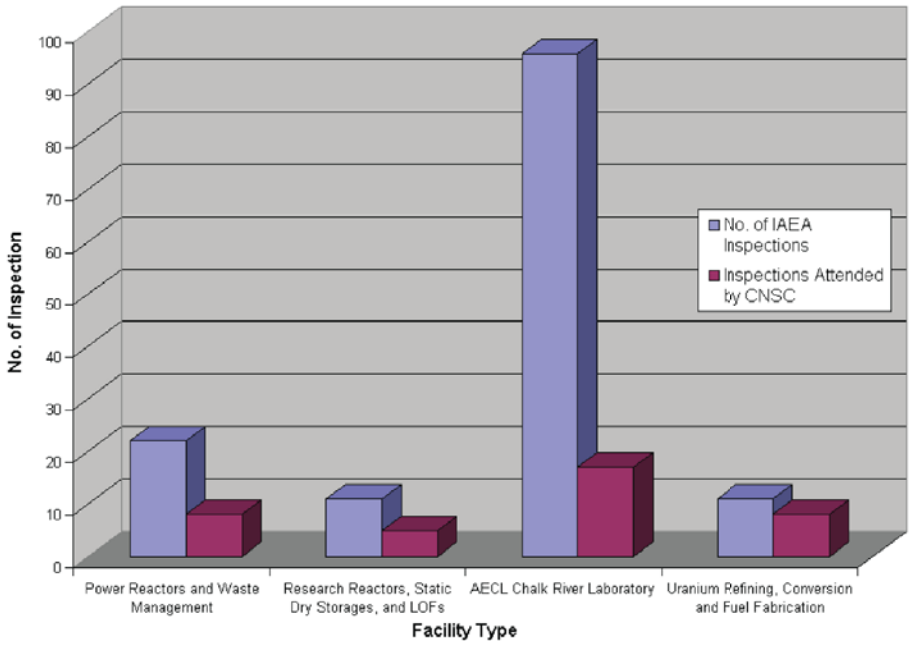
The IAEA verifies the design information provided by each safeguarded facility or location on a regular basis, through a design information verification (DIV). These activities are typically carried out in conjunction with one of the inventory inspections described above, and therefore the associated inspection effort (in PDIs) is not recorded separately.

4. CNSC participation in IAEA activities

To the extent possible, CNSC safeguards officers participate in inspection activities carried out by the IAEA in order to facilitate the exercise, mediate any disputes that may arise, and carry out domestic compliance activities whenever possible. However, participation is dictated by the level of available resources, as well as the nature of the particular inspection.

CNSC attendance at routine inventory inspections is generally high, especially for the intensive SIM-PIV exercises. Figure 2 indicates the CNSC participation rate for PIVs and IIVs in the 2006-2007 fiscal year.

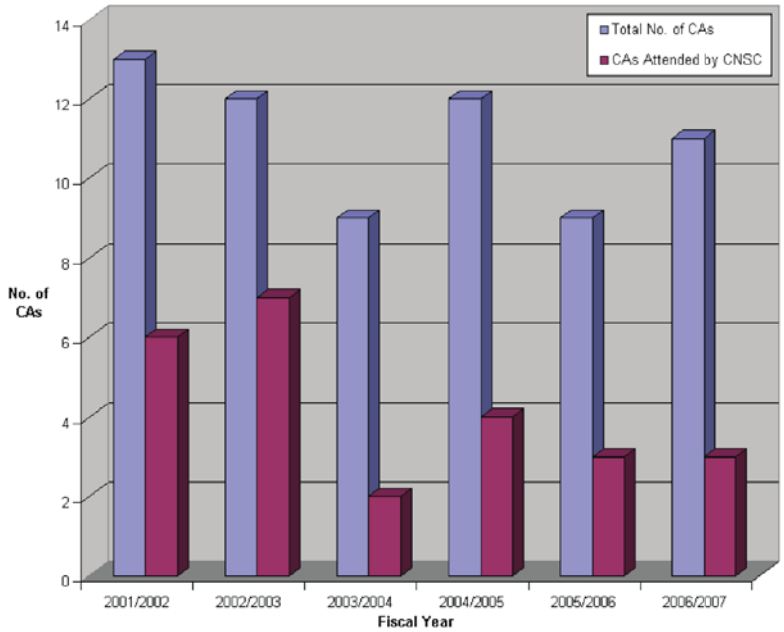
Figure 2: CNSC participation in routine IAEA inventory verifications (IIVs and PIVs)



As indicated by the names, short notice or unannounced inventory inspections are not pre-arranged with the CNSC (only 24 hours notice is given for SNRIs, 2 hours for UIs). As a result, it is generally not possible for CNSC safeguards officers to attend these inspections.

Similarly, CAs are typically arranged on a short notice basis (typically 24 hours advance notification is provided). Due to this short notice and based on a risk assessment of the locations chosen for access, CNSC safeguards officers do not attend all CAs conducted by the IAEA. Figure 3 provides an indication of CNSC participation in CAs carried out in Canada since 2000.

Figure 3: Complementary Access in Canada



ANNEX A – ACRONYMS

Abbreviation	Term
ABACC	Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials
AECL	Atomic Energy of Canada Limited
AECB	Atomic Energy Control Board (now CNSC)
AP	Additional Protocol
BC	Bundle Counter
C/S	Containment/Surveillance
CA	Complementary Access
CANDU	Canadian Deuterium Uranium
CASIC	Canadian/IAEA Safeguards Implementation Consultations
CDM	Core Discharge Monitor
CMD	Commission Member Document
CSSP	Canadian Safeguards Support Program
CNSC	Canadian Nuclear Safety Commission
CRL	Chalk River Laboratory
DFAIT	Department of Foreign Affairs and International Trade
DIQ/DIV	Design Information Questionnaire/Verification
DSS	Directorate of Security and Safeguards
DU	Depleted Uranium (< 0.72% U-235)
ESARDA	European SAfeguards Research and Development Association
IAEA	International Atomic Energy Agency
IIV	Interim Inventory Verification
INMM	Institute for Nuclear Materials Management
IS	Integrated Safeguards
ISD	International Safeguards Division
LEU	Low Enriched Uranium (~3 – 20% U-235)
LOF	Location Outside Facility
NGS	Nuclear Generating Station
NSCA	Nuclear Safety and Control Act (2000)
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
NU	Natural Uranium (~0.72% U-235)
NWS	Nuclear Weapon State
NNWS	Non Nuclear Weapon State
OPG	Ontario Power Generation
PDI	Person Days of Inspection
PIL	Physical Inventory Listing
PIT	Physical Inventory Taking
PIV	Physical Inventory Verification
PDV	Person Days of Verification
SAGSI	Standing Advisory Group on Safeguards Implementation
SIM-PIV	Simultaneous Physical Inventory Verification
SIR	Safeguards Implementation Report
SLA	State-Level Approach
SNRI	Short Notice Random Inspection
SSAC	State System of Accounting and Control
TDSD	Technical Development and Services Division
WMF	Waste Management Facility

ANNEX B – GLOSSARY OF TERMS

Additional Protocol: a protocol additional to a State's Safeguards Agreement with the IAEA, adopted in order to strengthen the effectiveness and improve the efficiency of the safeguards system.

Broad Conclusion: the most comprehensive safeguards conclusion that can be drawn by the IAEA, indicating that: (i) all declared nuclear material in a State is for peaceful, non-explosive uses and (ii) there is credible assurance that there are no undeclared nuclear materials or activities.

Canada-Agency Safeguards Implementation Consultation (CASIC): official bi-annual meeting held between the CNSC and the IAEA to discuss high-level issues related to the implementation of safeguards in Canada.

Complementary Access: the right of the IAEA pursuant to the Additional Protocol for short-notice access to any location in Canada, in order to: confirm the absence of undeclared nuclear material and activities; resolve a question relating to the correctness and completeness of information provided by the State; and confirm the decommissioned status of facilities and locations declared by the State.

Comprehensive Safeguards Agreement: an agreement pursuant to the NPT concluded between the IAEA and a given Non-Nuclear Weapon State, which applies safeguards on all nuclear material in all nuclear activities in that State.

Design Information Verification (DIV): activities carried out by the IAEA at a facility to verify the correctness and completeness of the design information provided by the State.

Facility: a reactor, a critical facility, a conversion plant, a fabrication plant, a reprocessing plant, an isotope separation plant or a separate storage installation, or any location where nuclear material in amounts greater than one effective kilogram is customarily used.

Integrated Safeguards: the optimum combination of all safeguards measures under a Comprehensive Safeguards Agreement and an Additional Protocol, to achieve maximum effectiveness and efficiency.

Interim Inventory Verification (IIV): an inspection activity covering inventory transactions (e.g. receipts) that have taken place since the last inspection.

Inventory Change Report (ICR): an accounting report provided by the State to the IAEA showing changes in the inventory of nuclear material.

Location Outside Facility (LOF): any installation or location, which is not a facility, where nuclear material is customarily used in amount of one effective kilogram or less.

Material Balance Report (MBR): an accounting report provided by the State to the IAEA showing the material balance based on a physical inventory of nuclear material actually present at a facility.

[1] Note: an "effective kilogram" is a special unit used in safeguards equal to the weight (in kilograms) of a quantity of safeguarded material multiplied by a factor determined by its enrichment level.

ANNEX B – GLOSSARY OF TERMS

Nuclear Material: any source or special fissionable material as defined in Article XX of the IAEA Statute (in practice, this means uranium, thorium, and plutonium).

Nuclear-Weapon State(s) (NWS): those States recognized by the NPT as having nuclear weapons as of 1 January 1967, when the Treaty was negotiated; namely, the United States, Russia, the United Kingdom, France, and China. All other signatories of the NPT are recognized as Non-Nuclear Weapon States (NNWS).

Person-Day of Inspection (PDI): a day during which a single inspector has access to a facility at any time, for a total of not more than eight hours.

Physical Inventory Listing (PIL): a report provided by the State to the IAEA in connection with a physical inventory, taken by the operator and listing all the nuclear material on site.

Physical Inventory Verification (PIV): an inspection activity covering all nuclear material at a facility, based on the operator's declaration of material inventories; typically conducted on an annual basis, although could be more or less frequent depending on the size of, and material handled by, a given facility.

Safeguards: a system of international inspections and other verification activities undertaken by the IAEA in order to evaluate, on an annual basis, a State's compliance with its obligations pursuant to its safeguards agreements.

Safeguards Implementation Report (SIR): The report of the Director-General of the IAEA to the Board of Governors on the annual findings and conclusions of the IAEA, which result from the implementation of safeguards in accordance with the various types of safeguards agreements.

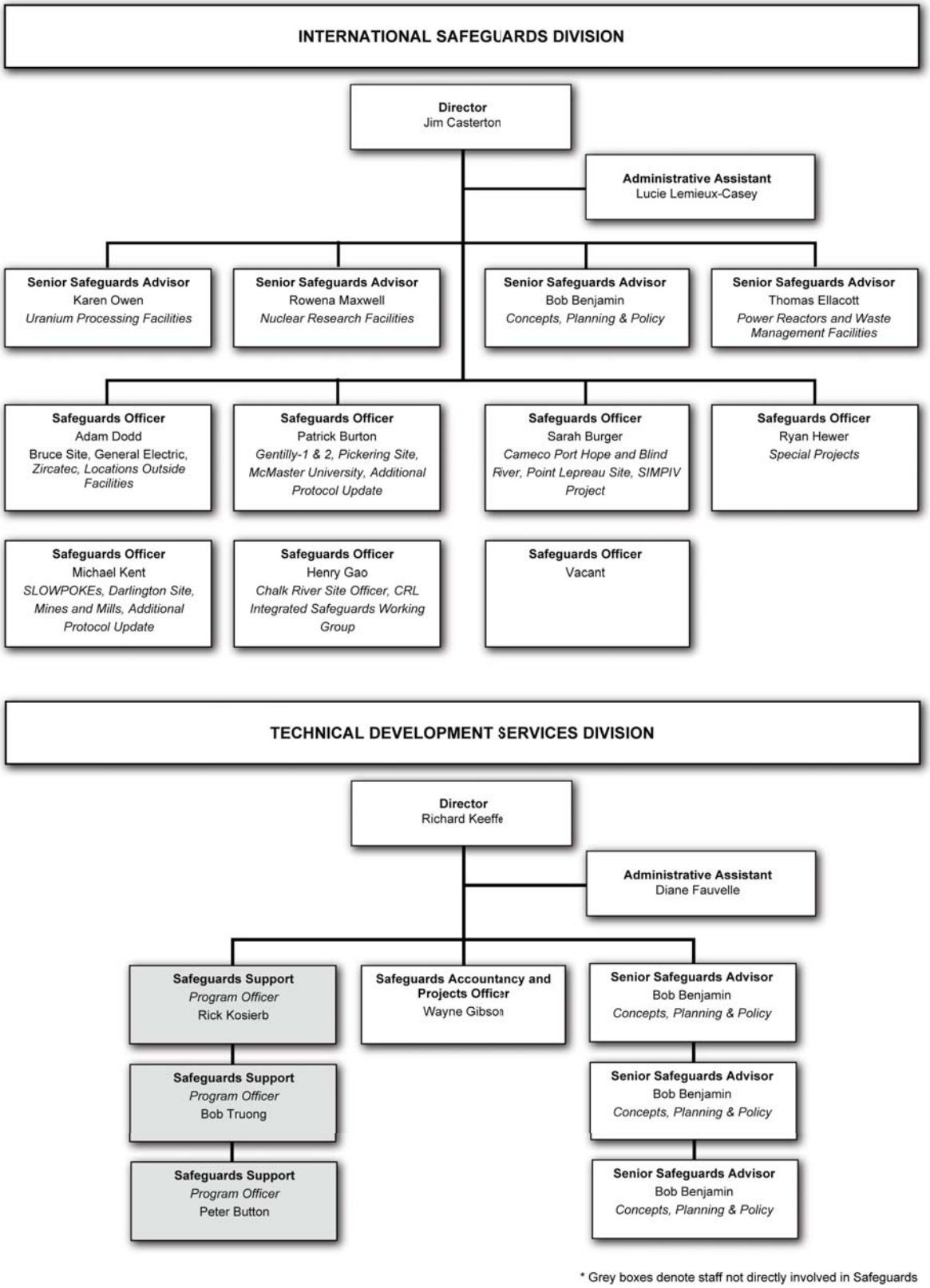
Starting Point of Safeguards: the point in the nuclear fuel cycle at which safeguards measures are first applied, as defined under Paragraph 34(c) of the Safeguards Agreement; in Canada, this means the input of uranium ore concentrate to the process line at Cameco's Blind River refinery.

State-Level Integrated Safeguards Approach (SLA): a new conceptual approach to safeguards that is based upon State-level (rather than facility-level) considerations; only possible in a State for which the broader conclusion has been drawn.

State System of Accounting and Control (SSAC): a national organization responsible for implementing the obligations of a State pursuant to its safeguards agreements with the IAEA.

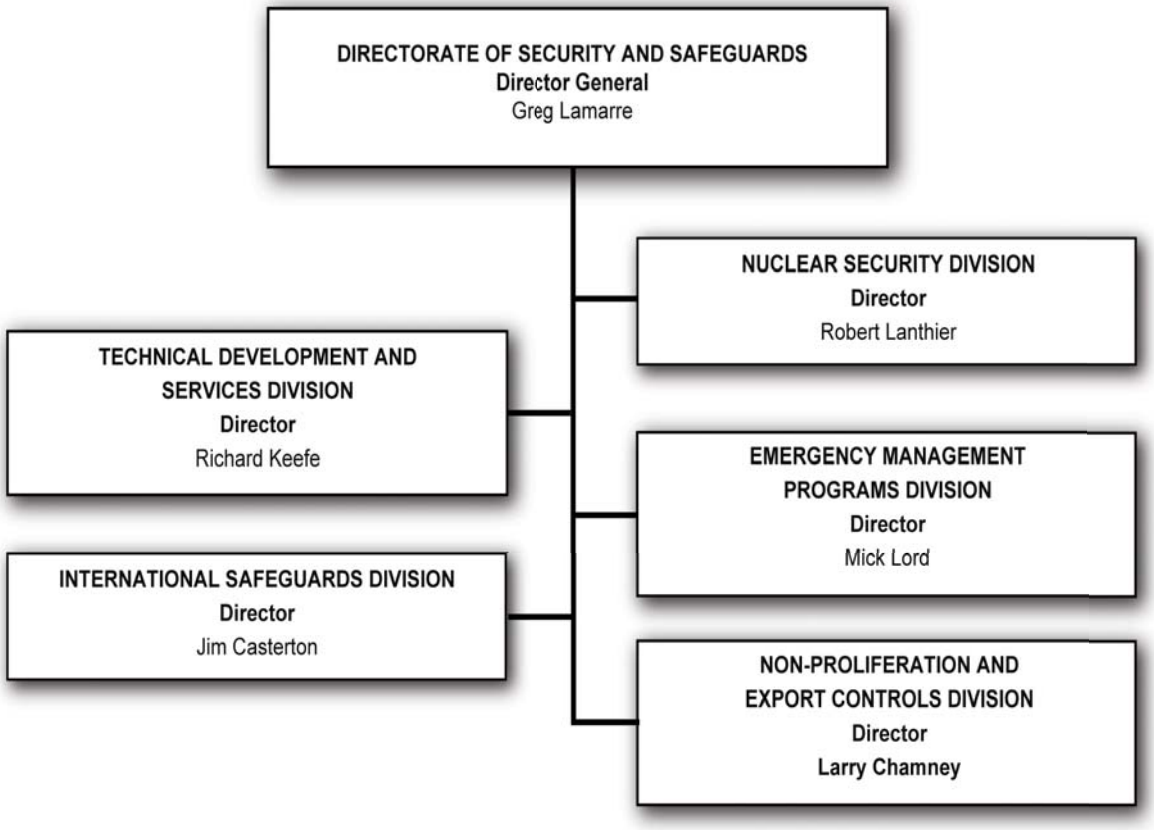
Treaty on the Non-Proliferation of Nuclear Weapons (NPT): The cornerstone of the nuclear non-proliferation regime, which entered into force in 1970 with the aims of: preventing the spread of nuclear weapons and weapons technology; fostering the peaceful uses of nuclear energy; and furthering the goal of disarmament. Article III of the NPT requires each non-nuclear weapon State party to the NPT to accept IAEA safeguards on all nuclear material in all peaceful nuclear activities within the territory of such State, under its jurisdiction, or carried out under its control anywhere.

ANNEX C – ORGANIZATIONAL CHARTS



* Grey boxes denote staff not directly involved in Safeguards

ANNEX C – ORGANIZATIONAL CHARTS



ANNEX D – OVERVIEW OF CANADIAN NUCLEAR FUEL CYCLE

Uranium Mining and Milling
Saskatchewan

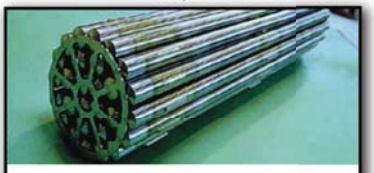
Uranium Refining
Cameco Blind River

Uranium Conversion
Cameco Port Hope

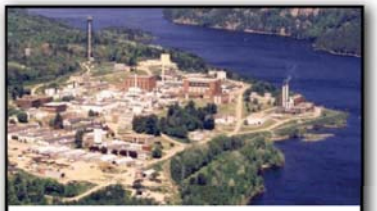
Spent Fuel Dry Storage
Pickering
Bruce
Darlington
Gentilly-2
Point Lepreau

Static Dry Storages
AECL Whiteshell
Douglas Point
Gentilly-1

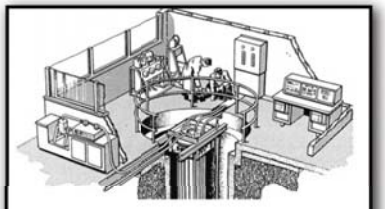
Nuclear Power Reactors
Bruce A & B
Pickering A & B
Darlington
Gentilly-2
Point Lepreau



Fuel Fabrication
Zircatec
GE - Hitachi



Nuclear Research and Development
AECL Chalk River Laboratory



Research Reactors
Dalhousie University,
Royal Military College,
Saskatchewan Research Council,
École Polytechnique de Montréal,
University of Alberta,
McMaster University

Locations Outside Facilities
Stern Laboratories,
TRIUMF,
AECL Sheridan Park,
Kinectrics,
MDS Nordion

ANNEX E: SOME RESPONSIBILITIES OF CANADA'S SSAC

The State shall…	The CNSC's Safeguards Program…
Establish and maintain a system of account for and control of all nuclear material subject to safeguards.	Maintains a national nuclear material accounting system of all records of shipments, receipts, nuclear production/loss, and other inventory changes as declared by the safeguarded facilities.
Arrange that records are kept in respect to each material balance area (MBA).	Maintains records for over forty MBAs for the purpose of nuclear material accountancy.
Make arrangements to facilitate the examination of records by IAEA inspectors.	Interacts with the IAEA regarding requirements for nuclear material reporting and ensures accurate and precise reports. Provides IAEA access to facility records.
Provide the Agency with inventory change reports and material balance reports.	Prepares periodic reports for the IAEA (Inventory Change Report, Material Balance Report and Physical Inventory Listing).
Notify the Agency in advance of the international shipment or receipt of nuclear material.	Provides the IAEA with notification on imports and exports of nuclear material.
Provide the Agency with information concerning nuclear material under safeguards and the features of facilities relevant to safeguarding such material.	Provides timely reports to the IAEA on nuclear material accountancy (see above) and on the design of safeguarded facilities.
Provide the Agency with an annual declaration containing: • location of nuclear fuel cycle-related research and development activities not involving nuclear material • a general description of each building on each safeguarded site, including its use and contents • information on uranium mines and concentration facilities • information regarding source material which has not reached the composition suitable for fuel fabrication • information on nuclear material exempted from safeguards • the import/export of nuclear material and nuclear-related materials and technology • future plans relevant to the development of the nuclear fuel cycle.	Provides a yearly declaration to the IAEA outlining these activities (except for the exports of nuclear material and technologies, which are reported quarterly). CNSC staff typically spends over three hundred hours in the span of six months, reviewing, revising and compiling the thirteen hundred entries from thirty facilities related to the nuclear fuel cycle. Licensees also contribute significant amounts of time to the annual declaration.
Grants IAEA short-notice access to any location identified in Canada's declaration, or to decommissioned facilities, for the purpose of assuring the absence of undeclared nuclear material and activities.	Facilitates short-notice complementary access requests. To date, the CNSC has facilitated sixty-six CAs across Canada.
Conclude a Subsidiary Arrangement for the specific implementation of safeguards.	Concluded Subsidiary Arrangements with the IAEA in September 1972; amended in 1973 and 2002.

ANNEX F: COMPLEMENTARY ACCESS IN CANADA

No.	Date	Location
1	11 July 2001	Rabbit Lake
2	23 July 2001	Cameco Blind River
3	24 July 2001	Stanleigh Mine
4	19 September 2001	Bruce Heavy Water Plant
5	20 September 2001	AECL Douglas Point
6	12 October 2001	Cameco Port Hope
7	15 October 2001	Cameco R&D Lab (Saskatoon)
8	18 October 2001	AECL Whiteshell Labs (WR-1)
9	24 October 2001	Cameco Blind River
10	14 November 2001	Darlington NGS, Bldg. 42
11	15 November 2001	Pickering NGS, Bldgs. 20, 21, 22, 24, 25, 26, & 28
12	22 November 2001	AECL Chalk River, Bldgs. 145, 105, & 492
13	14 March 2002	AECL NPD (Rolphton)
14a	25 April 2002	Combustion Engineering (Moncton)
14b	18 August 2002	Combustion Engineering (Moncton)
15	1 May 2002	MDS Nordion
16	9 July 2002	AECL Chalk River, Bldg. 215
17	11 July 2002	Gentilly-1
18	16 July 2002	GE Peterborough
19	19 July 2002	Cameco Port Hope
20	23 July 2002	AECL Chalk River, Bldg. 220
21	24 July 2002	AECL Whiteshell Labs, Bldg. 415
22	12 August 2002	AECL Chalk River, Bldg. 412
23	26 September 2002	McClean Lake Project (Saskatchewan)
24	1 October 2002	Cameco Blind River
25	5 March 2003	AECL CRL, Bldgs. 223 & 228
26	30 May 2003	Cameco Port Hope, Bldgs. 40, 41, 42
27	6 June 2003	Point Lepreau
28	29 July 2003	Darlington NGS
29	31 July 2003	Gentilly-2 NGS
30	8 October 2003	Zircatec Precision Industries
31a	25 November 2003	Westinghouse Plants 1 and 2
31b	13 January 2004	Westinghouse Plant 1
32	11 December 2003	AECL CRL, Bldg. 467
33	22 January 2004	WUFDSF, Bldgs. 578 and 714
34	27 January 2004	AECL CRL, Bldg. 250
35	3 June 2004	Point Lepreau
36	4 June 2004	Westinghouse, Varennes Quebec
37	14-17 June 2004	AECL CRL, Multiple Bldgs.

ANNEX F: COMPLEMENTARY ACCESS IN CANADA

No.	Date	Location
38	30 June 2004	Bruce NGS, Bldgs. 173, 176, 179, 180, 500, & 917
39	13 September 2004	McMaster Nuclear Reactor
40	14 September 2004	Cluff Lake
41	15-16 September 2004	TRIUMF
42	22-23 September 2004	AECL WL, Bldgs. 417, 421, 431, 432, 433, 503
43	1 October 2004	Earth Sciences Extraction Company, Calgary
44	9 December 2004	AECL CRL, Bldg. 200
45	13 December 2004	AECL CRL, Bldg. 137
46	23 February 2005	AECL CRL, Bldg. 375
47	26 April 2005	Gentilly-2 NGS, Various Bldgs.
48	13 May 2005	AECL CRL, Bldg. 168
49	30 June 2005	Pickering NGS, D2O Plant, Feed Storage Area
50	20 July 2005`	AECL Sheridan Park, Bldg. SP1
51	25 August 2005	Bruce A, Bldgs. 109 and 116
52	06 October 2005	AECL CRL Bldgs. 591 and 599A
53	14 October 2005	Darlington NGS Bldgs. 22 and 135
54	24 October 2005	AECL Whiteshell, Bldgs. 303, 304, 306, 307, 307A
55	10 November 2005	Kinectrics
56	21 April 2006	Point Lepreau Bldgs 12, 22, 41, 42
57	28 April 2006	Gentilly-1
58	11 May 2006	AECL CRL Bldgs. 204A and 204B
59	23 May 2006	Cameco Port Hope
60	21 June 2006	Bruce Power, Bldg. 943
61	8 August 2006	AECL NPD
62	29 September 2006	AECL Chalk River Bldg. 320
63	24 October 2006	Whiteshell Labs, Bldgs. 100 and 300
64	1 November 2006	MDS Nordion
65	20 November 2006	AECL CRL Bldg. 469
66	8 March 2007	AECL CRL Bldg. 215
67	30 April 2007	AECL CRL Bldg. 610

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