Atomic Energy Control Board

1997-98
Estimates

Partie III

Plan de dépenses

The Estimates Documents

The Estimates of the Government of Canada are structured in three Parts. Beginning with an overview of total government spending in Part I, the documents become increasingly more specific. Part II outlines spending according to departments, agencies and programs and contains the proposed wording of the conditions governing spending which Parliament will be asked to approve. The Part III documents provide additional detail on each department and its programs primarily in terms of the results expected for the money spent.

Instructions for obtaining each volume can be found on the order form enclosed with Part II.

Available in Canada through

Associated Bookstores and other booksellers

or by mail from

Canada Communication Group – Publishing
Ottawa, Canada K1A 0S9

Catalogue No. BT31-2/1998-III-15
ISBN 0-660-60073-0

Atomic Energy Control Board

1997-98 Estimates

Part III

Expenditure Plan

Approved

Minister of Natural Resources

Preface

This document is a report to Parliament to indicate how the resources voted by Parliament have or will be spent. As such, it is an accountability document that contains several levels of details to respond to the various needs of its audience.

The Part III for 1997-98 is based on a revised format intended to make a clear separation between planning and performance information, and to focus on the higher level, longer term plans and performance of departments.

The document is divided into four sections:

- The President's Executive Summary;
- Departmental Plans;
- Departmental Performance; and
- Supplementary Information

It should be noted that, in accordance with Operating Budget principles, human resource consumption reported in this document will be measured in terms of employee full-time equivalents (FTEs).

Table of Contents

Section I
President s Executive Summary

A. Highlights

The major highlights of recent performance, and plans for 1997-98 are summarized below:

- the serious deficiencies in the 50-year-old *Atomic Energy Control Act* have been widely recognized; new legislation is proceeding through the Parliamentary process;

- during 1996-97 and into 1997-98, the AECB will continue its efforts to strengthen the effectiveness and improve the efficiency of the International Atomic Energy Agency's (IAEA) safeguards in accordance with the IAEA's "Programme 93+2"; as an early signatory to the Treaty on the Non-Proliferation of Nuclear Weapons, Canada supports international safeguards as a means to avert the proliferation of nuclear weapons;

- Canada has been elected Chair of the next Nuclear Suppliers Group (NSG) Plenary, to be held in Ottawa, in May 1997; the AECB President will assume this position on behalf of Canada; the NSG is a group of 34 countries that has established guidelines for international transfers of nuclear items to provide assurance that transfers do not contribute to the proliferation of nuclear weapons or other nuclear explosive devices;

- following the unsuccessful challenge of the *Nuclear Liability Act* (NLA) by Energy Probe and others, an appeal was launched; however, the appeal was subsequently withdrawn early in 1996; with the challenge to the NLA now settled, the review of the NLA has resumed under the leadership of Natural Resources Canada, with the AECB as a participant;

- training for foreign regulatory agency staff is offered to countries which have bought or have shown significant interest in buying Canadian nuclear technology; in this regard, a training program for Chinese regulators will be undertaken; in addition, as part of Canada’s aid to the countries affected by the disintegration of the former Soviet Union, the AECB has offered and will continue to offer training to nuclear regulators in Russia, Ukraine, Lithuania and Slovakia;

- the AECB is devoting increasing resources to the support of the environmental review process; the implementation of the *Canadian Environmental Assessment Act (CEAA)* and in particular, participation in panel reviews is consuming significantly more technical resources than had been forecast; in 1996, the AECB supported panels considering the decommissioning of Elliot Lake uranium mines, the high level waste management concept and several new uranium mines in Saskatchewan; the panel on high level waste is expected to complete its deliberations in 1997, whereas the panel considering the development of uranium mining in Saskatchewan will likely continue to be active for several years to come;

- the AECB has signed a contract with Atomic Energy of Canada Limited (AECL) to review the technology that AECL wishes to sell to foreign countries and to give a formal opinion to AECL on whether there appears to be any major impediments to this technology being licensable in Canada; the full cost of this activity is being recovered from AECL;

- under the federal-provincial Efficiency of the Federation Initiative, the AECB and Human Resources Development Canada (HRDC) have commenced discussions with the Province of Saskatchewan to attempt to reach agreement on means to reduce overlap and duplication in the regulating of health, safety and environmental protection in Saskatchewan uranium mines; agreement should be arrived at in 1997 and would involve the Province of Saskatchewan administering a part of the federal regulatory program;

- Canada has assumed a lead role in the development of an international convention on radioactive waste management with a member of AECB staff leading the Canadian delegation; it is hoped that this convention will be open for signature in fiscal 1997-98; and

- in August 1995, the AECB began a major project aimed at providing detailed recommendations for improvements in the institution's regulatory and management practices; recommendations were submitted for executive consideration in June 1996; the AECB's executive is working on these recommendations and is implementing those that are approved; this is a gradual process which will continue into 1997-98; the result will be an important contribution to the establishment of improved management processes for the AECB and an up-to-date, business-like operation for the long-term.

Section II
Departmental Plan

A. Summary of Departmental Plans and Priorities

During 1997-98, continuing effort will be put towards the following strategies and initiatives:

- establish a sound legislative base for nuclear regulation;
- reduce overlap and duplication;
- reduce costs to the Federal Treasury;
- implement approved recommendations from 'Project 96 and Beyond';
- contribute to the international management of nuclear activities;
- maintain support of Canadian policy on the non-proliferation of nuclear weapons; and
- continue to improve the AECB's practice of offering an open regulatory process which is easily accessible to all persons in Canada.

Performance for 1997-98 will be measured using the following indicators:

- publish for public comment new *Nuclear Safety Regulations* within three months of the passage of the new *Nuclear Safety and Control Act* (NSCA);
- implement changes to Board membership mandated by the new NSCA;
- complete a review of the nearly 4,000 licences issued by the AECB within 36 months of coming into force of the new NSCA;
- review and plan the revision of AECB regulatory documents;
- introduce changes to management, organization, and/or procedures based on the recommendations arising from 'Project '96 and Beyond';
- complete negotiations aimed at obtaining new arrangements with provinces within 18 months of the coming into force of the new NSCA;
- initiate negotiations aimed at obtaining new Memoranda of Understanding with federal departments and agencies within 18 months of the coming into force of the new NSCA; and
- investigate means for obtaining services from other federal government departments on a sound contractual basis.

B. Departmental Overview

Established in 1946 by the *Atomic Energy Control Act*, R.S.C., 1985, c. A-16, the Atomic Energy Control Board (AECB) is a departmental corporation, named in Schedule II to the *Financial Administration Act*, that reports to Parliament through a designated Minister, currently the Minister of Natural Resources Canada.

On March 21, 1996 the Minister of Natural Resources Canada introduced the *Nuclear Safety and Control Act* (NSCA) in the House of Commons. The Act will replace the *Atomic Energy Control Act* of 1946 with a modern statute that reflects public expectations for the regulation of nuclear energy. The NSCA will rename the Atomic Energy Control Board (AECB) the Canadian Nuclear Safety Commission and is designed to eliminate unnecessary overlap and duplication by encouraging cooperative regulatory arrangements between federal and provincial agencies.

The challenges of nuclear safety, waste management and non-proliferation of nuclear weapons that will face Canada and the world in the next 50 years make it important that the federal government continue the strong central regulatory control over this technology that it has exercised for the last 50 years.

1. Mission Statement

The AECB mission is to ensure that the use of nuclear energy in Canada does not pose undue risk to health, safety, security and the environment. The AECB achieves its mission through a comprehensive licensing system that covers all aspects of nuclear facilities, prescribed substances, and equipment, including the certification of domestic and foreign transport package designs. The licensing system is administered so that the concerns and responsibilities of federal and provincial government departments in such areas as health, environment, transport and labour are taken into account when licences are issued by the AECB.

This mission also extends to the control of the import and export of prescribed substances, equipment and technology, and it reflects Canadian participation in the activities of the International Atomic Energy Agency and compliance with the requirements of the Treaty on the Non-Proliferation of Nuclear Weapons for the application of nuclear safeguards in Canada (in the vocabulary of the nuclear industry, the term safeguards is reserved for measures taken to verify compliance with undertakings pursuant to the Treaty on Non-proliferation of Nuclear Weapons). It covers both the domestic and international security of nuclear materials, equipment and technology.

The AECB also contributes to international agencies and assists some developing and newly emerging nations in improving their regulatory controls over nuclear materials and facilities through bilateral and multilateral cooperation.

2. Program Objective

The Program objective is to ensure that nuclear energy in Canada is only used with due regard to health, safety, security and the environment, and to support Canada's participation in international measures to prevent the proliferation of nuclear weapons.

3. Program Organization for Delivery

Activity Structure: The AECB's Program has one activity - administration of the regulations made under the *Atomic Energy Control Act* and participation in measures for international control of atomic energy. Management, planning and resource control are broken down into 13 licensing activities as shown in Figure 5.

Organization Structure: The Atomic Energy Control Board consists of five members, the President being the only full-time member. The President is the Chief Executive Officer of the AECB; she supervises and directs the work of the organization. Through the President, the Board receives advice from two independent committees — the Advisory Committee on Radiological Protection and the Advisory Committee on Nuclear Safety — composed of technical experts from outside the AECB; a Legal Services Unit, composed of lawyers provided from the Department of Justice; and a Medical Liaison Officer, who represents senior medical officers nominated by the provinces and other federal departments and agencies.

The AECB staff implements the policies of the Board and makes recommendations to the Board concerning the issuing of licences, and other regulatory matters; staff is organized into five functional units. A matrix showing the allocation of resources by licensing activity and functional unit is found in Figure 24.

It is estimated that in 1997-98, 401 employees will be assigned to carry out the functions of the AECB'S Program.

The Directorate of Reactor Regulation: is responsible for all regulatory aspects necessary to protect workers, the public and the environment against the risks associated with nuclear reactors and heavy water plants and research establishments. Regulation involves the evaluation of applications for licences against safety standards and requirements set by the AECB, the issuance of licences, the surveillance of licensees' operations to ensure compliance with regulations, and the review of the training and authorization of reactor operators.

The Directorate of Fuel Cycle and Materials Regulation: is responsible for all regulatory aspects necessary to protect workers, the public and the environment against the risks associated with uranium mining, milling and refining, fuel fabrication, particle accelerators and radioactive waste management, as well as nuclear facilities under decommissioning. This regulation involves similar activities to those listed for reactors above. The functional unit is also responsible for all regulatory aspects relating to the possession, use and sale of nuclear materials, i.e. uranium, thorium and radioisotopes, and their safe packaging for transportation, to protect workers and the public against undue hazards from these materials. The resources required for this functional unit are highly dependent on the level of business in the nuclear industry in Canada, including all uses of radioisotopes; another major influence is the level of uranium mining and milling activity.

The Directorate of Analysis and Assessment: carries out detailed review and assessment of documentation submitted by licensees as part of their licence application to demonstrate the safety of their designs, the adequacy of their quality assurance, and the protection from radiation hazards threatening both workers and the environment. The Directorate is also responsible for the development of standards and guidelines for safety analysis, radiation protection, safety of pressure-retaining components and quality assurance.

The President s Office and Secretariat: has overall responsibility for corporate planning and services; operation of the five-member Atomic Energy Control Board, including the logistics of meetings involving intervenor appearances and/or regional travel; liaison with Parliament and the office of the AECB's designated Minister; interface with seconded legal counsel; application of the *Nuclear Liability Act,* the *Canadian Environmental Assessment Act*, the *Access to Information* and *Privacy Acts*; communications with the public, news media and special interest groups; the consultation process regarding regulatory proposals and licensing decisions; and the administrative and scientific support for two independent advisory committees dealing with radiation protection and nuclear safety. The Research and Safeguards Division which is also under the reponsibility of the Secretariat supports licensing activities by ensuring that Canadian nuclear facilities comply with international safeguards and physical security requirements. As well, the division issues import and export licences pursuant to the *Atomic Energy Control Act*, and undertakes numerous activities associated with the implementation of Canada's nuclear non-proliferation and export control policies. The AECB also participates in and assists international activities to limit the spread of nuclear weapons. The Canadian Safeguards Support Program assists the International Atomic Energy Agency (IAEA) by providing technical assistance and other resources, and by developing equipment to improve the effectiveness of IAEA safeguards. Finally, the Secretariat includes the AECB Training Centre which has responsibilities associated with both corporate and foreign training.

The Directorate of Administration: administers the AECB's human resources, finance and material management, cost recovery and information management. In addition, the Directorate administers the AECB's research program by which research contracts are let in order to obtain information required for regulatory activities. In conjunction with the client divisions who need the information, specialist staff in the Directorate select contractors, follow the work as it develops, and generally ensure that the contracts are administered in accordance with government requirements.

4. Authorities for 1997-98 Part II of the Estimates

Figure 1: Financial Requirements by Authority ($000)

Vote		1997-98 Main Estimates	1996-97 Main Estimates
	Atomic Energy Control Board		
20	Program expenditures	**38,136**	40,233
(S)	Contributions to employee benefit plans	**4,107**	3,690
	Total Agency	**42,243**	43,923

Figure 2: Votes - Wording and Amounts

Vote	(dollars)	1997-98 Main Estimates
	Atomic Energy Control Board	
20	Atomic Energy Control Board - Program expenditures, the grants listed in the Estimates and contributions	**38,136,000**

Figure 3: Program by Activity ($000)

	1997-98 Main Estimates			1996-97 Main Estimates
	Budgetary		**Total**	
	Operating	Transfer Payments		
Administration of *Atomic Energy Control Regulations* and participation in measures for international control of atomic energy	41,585	658	**42,243**	43,923

Net Cost of Program: The Estimates of the Program include only expenditures to be charged to the Program's voted and statutory authorities. Other cost items, as well as revenues, need to be taken into account to arrive at the net cost of the Program. Details are provided in Figure 4.

Figure 4: Estimated Net Cost of Program for 1997-98 ($000)

		Estimates 1997-98	Estimates 1996-97
Operating Expenditures		**40,924**	42,657
Minor Capital		**661**	661
Transfer Payments		**658**	605
		42,243	43,923
Services Received Without Charge			
Legal representation	- from Department of Justice	**208**	203
Accommodation	- from Public Works and Government Services Canada	**3,407**	3,406
Financial Audit	- from Office of the Auditor General	**38**	32
Cheque issue services	- from Public Works and Government Services Canada	**20**	41
Employer's share of employee benefits covering insurance premiums and costs	- from Treasury Board	**1,377**	1,476
Workers' Compensation	- from Human Resources Development Canada	**13**	50
Total Program Costs		**47,306**	49,131
Revenues credited directly to the Consolidated Revenue Fund*		**(33,183)**	(34,786)
Estimated Net Program Cost		**14,123**	14,345

* See Figure 19 for details

Figure 5: Appropriated Planned Spending ($000)

Licensing Activity	Estimates 1996-97	**Estimates 1997-98**	Forecast 1998-99	Forecast 1999-2000
Nuclear Reactors and Heavy Water Plants	27,726	**24,848**	24,884	24,884
Research Reactors	495	**418**	418	418
Nuclear Research and Test Establishments	1,864	**1,671**	1,674	1,674
Uranium Mines	3,674	**3,405**	3,410	3,410
Nuclear Fuel Facilities	1,008	**861**	862	862
Prescribed Substances	183	**232**	232	232
Accelerators	360	**335**	336	336
Radioisotopes	7,491	**6,790**	6,800	6,800
Transportation	255	**523**	524	524
Waste Management and Decommissioning	1,567	**1,640**	1,642	1,642
Import/Export	290	**365**	366	366
Dosimetry	169	**175**	175	175
Non-licensing Activities	4,049	**6,043**	6,051	6,051
Total Planned Spending	49,131	**47,306**	47,374	47,374
Services Provided Without Charge	(5,208)	**(5,063)**	(5,063)	(5,063)
Net Planned Spending	43,923	**42,243**	42,311	42,311

C. Details by Business Line

1. Initiatives for 1997-98

Establish a Sound Legislative Base for Nuclear Regulation: New legislation has been tabled in Parliament. Bill C-23, whose short title is the *Nuclear Safety and Control Act*, and which will establish the Canadian Nuclear Safety Commission (CNSC), was tabled in March 1996 and is presently with the Standing Committee on Natural Resources for review. Assistance will be rendered to the Minister and her Parliamentary Secretary in guiding the Bill through Committee and preparing any necessary amendments. This new Act will correct significant weaknesses in the current one, and will give to the Commission which succeeds the present Board the powers commensurate with its responsibilities, both nationally and internationally. Significant is the specific power to impose licence fees and to require financial guarantees where appropriate.

In parallel with the legislative process, an extensive set of new regulations is being prepared with a view to publishing them for public comment following the passage of the new Act. All outstanding licences issued pursuant to the *Atomic Energy Control Act* will have to be modified and reissued. Many of these have terms of two years or less and will be replaced as they expire.

One such regulation deals with the maximum radiation exposure levels to which atomic radiation workers and members of the public can be exposed. New regulations have been developed which take into account new international recommendations.

Reduce Overlap and Duplication: The *Nuclear Safety and Control Act* will explicitly allow for adoption by reference of other legislation, and its administration by the named agency or department. This will further enhance the AECB's ability to reduce duplication and overlap with federal and provincial agencies and departments, which is achieved in the following ways:

- concentrating the AECB licensing program on the assessment of nuclear safety, health, security and environmental protection related to the use of nuclear material and facilities; and

- utilizing regulatory resources more efficiently by negotiating with other federal departments and agencies arrangements for consultation, technical expertise and, where appropriate, joint regulatory action in the fields of public and occupational health, safety, and protection of the environment; areas of cooperation include transport of dangerous goods, environmental monitoring, worker protection, seismology, and inspection of boilers and pressure vessels.

Reduce Costs to the Federal Treasury: With the proclamation of the new Act, the cost recovery program of the AECB will be placed on a firmer legal base. The program and the regulated industry is reaching maturity so that costs of regulation are more stable and predictable. It should, therefore, be possible to develop a new fee-setting scheme by which fees could be set on forecast, rather than historic costs.

Since the beginning of the cost recovery program it has been accepted that fees would not be charged to certain licensees (e.g., most hospitals, publicly funded educational institutions and federal government departments) or for certain functions (e.g., some international non-proliferation work).

A review will be conducted of the criteria for exemptions from licence fees. Once this review has determined the portion of AECB costs which are deemed non-recoverable, fees for licences and related services will be set to fully recover all other costs.

It is the AECB's intention to achieve full cost recovery by the end of fiscal year 1998-99.

Project '96 and Beyond: In 1995, the AECB President launched a special initiative, 'Project '96 and Beyond'. The object of the project was an extensive review of the AECB's roles, responsibilities and internal management practices, taking into account interactions with other federal and provincial jurisdictions. The review, carried out by AECB staff, resulted in some 400 recommendations which are being dispositioned by the President and Executive Committee. The resulting actions which will be taken will put the agency on the path of continued performance improvement towards ensuring that the AECB is as efficient, effective and as business-like as possible.

Contribute to the International Management of Nuclear Activities: International agencies and the developing and newly emerging nations will be helped to improve regulatory controls over nuclear materials and facilities through bilateral and multilateral cooperation.

- Cost-free experts will be made available to furnish advice to international agencies such as the IAEA;
- Canada's bilateral nuclear co-operation agreements will be administered by the AECB through arrangements with its foreign counterparts;
- a member of AECB staff will continue to work as Special Nuclear Science Counsellor to the Canadian Mission in Vienna, Austria;
- a member of the AECB staff has been invited by the Director General of the IAEA to sit on the Standing Advisory Group for Safeguards Implementation;
- other members of AECB staff will continue to participate in various IAEA committees, including all the senior advisory committees on safety standards;
- liaison will be maintained with regulatory agencies in other countries concerning regulatory and safety matters of mutual interest; and
- technical staff of foreign agencies will be trained to assist in the development of nuclear legislation and regulation worldwide.

Non-Proliferation of Nuclear Weapons: The AECB will maintain its support of Canadian policy on the non-proliferation of nuclear weapons and assist international development of strict controls on nuclear items usable in nuclear weapons. This will be done in the following ways:

- supporting the Department of Foreign Affairs and International Trade in strengthening the international nuclear non-proliferation regime;
- implementing Canadian nuclear non-proliferation policy with regard to nuclear exports;

- implementing Canada's bilateral nuclear cooperation agreements;

- participating in the development of new inspection and surveillance techniques to improve effectiveness and efficiency of the safeguards system; and

- supporting the development of specialized safeguards equipment.

Open Government: The AECB intends to continue to improve its practice of offering an open regulatory process which is easily accessible to all persons in Canada. This could involve:

- making information available electronically, to further improve ease of access for interested parties, and hence consultation during the licensing process;

- actively participating in public hearings held by other agencies, such as the Canadian Environmental Assessment Agency;

- publicizing all significant licensing decisions in the region where they are likely to have the most effect; and

- holding AECB meetings in the vicinity of major nuclear facilities.

Human Resources Framework: The AECB is a separate employer with the President having been authorized, by an Order in Council, to exercise and perform the powers and functions of Treasury Board regarding the management of human resources at the agency. Upon proclamation of the new Act, reconfirmation of this authorization will be required to allow the AECB to continue to function with the same degree of flexibility and efficiency.

The authority to function as a separate employer has resulted over the years in numerous and extensive efficiencies and cost savings with no disadvantage to the well-being of employees. It is, therefore, seen as essential that at least the same degree of autonomy be continued.

Foreign Training Program: Training for foreign regulatory agency staff is offered to countries which have bought or have shown significant interest in buying Canadian nuclear technology; in this regard, a significantly large training program for Chinese regulators will be undertaken; in addition, as part of Canada's aid to the countries affected by the disintegration of the former Soviet Union, the AECB has offered and will continue to offer training to nuclear regulators in Russia, Ukraine, Lithuania and Slovakia.

Regulatory Effectiveness: The AECB's regulatory effort aimed at ensuring safe operations in all parts of the nuclear industry is ongoing. In 1996-97 the AECB continued to improve the effectiveness of licensing, inspection and enforcement procedures at both nuclear power plants and locations where radioisotopes are being used. Improvements will continue in 1997-98.

Emergency Response Plan: Emergency planning is an essential component of any comprehensive nuclear power program. In Canada a matrix of federal departments (and provincial ones) would be involved if a nuclear emergency were to occur. The role and responsibilities of the AECB during a nuclear emergency were reviewed and documented in a new emergency response plan (the Plan). Implementation of the Plan to ensure the AECB could meet its defined role and responsibilities was started in 1995-96 and continued in 1996-97. Implementation will be completed in the 1997-98 fiscal year.

Figure 6: Spending Profiles for Planning Period ($000)

	1996/97	1997/98	1998/99	1999/2000
Reference Level	43,923	42,243	42,311	42,311
Forecasted Costs Recovered	34,786	33,183	31,860	32,723
Net Cost	9,137	9,060	10,451	9,588

2. External Factors Influencing the Program

A number of factors beyond the control of the AECB have a significant effect on the nature and extent of the AECB Program content. The most significant of these factors are discussed below.

Developments in the Nuclear Industry: Since the primary role of the AECB is to regulate the use of nuclear energy and ensure that activities associated with its use are carried out safely, the extent of such use is a key factor that determines the AECB's activities and resource needs. Its resource needs, therefore, are related to the number and type of nuclear facilities and users of nuclear materials.

Four new uranium mines in the province of Saskatchewan are expected to commence operation in the next five years. All six operating mines in the Elliot Lake area of Ontario have closed and are being decommissioned. The Cigar Lake, Midwest and McArthur River projects began undergoing public review by a panel in 1996. The McClean Lake project is under construction, and has received conditional approval to mine the JEB pit.

It is unlikely that any new power reactors will be constructed in Canada in the near future. However, of the existing 21 reactor units now in operation, the older units are starting to show signs of ageing. This reality, together with the economic restraints that are affecting the Canadian nuclear utilities to varying degrees, have stressed the need for close surveillance of reactor unit safety performance by the AECB staff.

AECB effort in reviewing the CANDU 9 design, on which AECL is currently working, will be reduced significantly in early 1997. However, significant effort will still be required to review the design and safety analysis of the Medical Isotope project to be constructed at Chalk River Laboratories (2 MAPLE reactors and a processing facility) and the Irradiation Research Facility (IRF) which is being designed to replace the aging National Research Universal (NRU) reactor at Chalk River Laboratories. Regulatory review is also foreseen for the enhanced CANDU 6 reactors.

The performance of licensees also affects the AECB resource needs. Any major deviation from normal performance (e.g., a serious accident) would necessitate intensified activity by the AECB, whether it be for major facilities or the wide variety of uses of radioisotopes. The loss-of-coolant accident that occurred in a Pickering reactor in December 1994, was a case in point. Although the radiological effects were near zero, the event required considerable regulatory follow-up to ensure that corrective action was taken at all plants in Canada. Similarly, a deterioration in the operating practices and maintenance standards at the Pickering plant necessitated a major increase in regulatory surveillance.

Expenditure Reduction Measures: Since April 1993, a series of reductions were announced to the AECB reference levels. The total reductions range from $2.9M in 1995-96, to $3.6M in 1998-99. These reductions will have a direct negative impact on the efforts undertaken to improve the effectiveness of the Canadian nuclear regulatory program. To accommodate these reductions, the AECB reevaluated its priorities and adjusted the salary and non-salary components of its budget in a way that minimizes the impact of these budget reductions on the AECB's ability to ensure an adequate level of safety in the nuclear industry. AECB will continue its adjustments in 1997-98.

International Involvement: Since nuclear energy is an international technology, the AECB participates in, or closely monitors, activities of international agencies, in particular the International Atomic Energy Agency (IAEA), the Nuclear Energy Agency of the Organization for Economic Co-operation and Development (OECD), the International Commission on Radiological Protection, the United Nations Scientific Committee on Effects of Atomic Radiation and other such bodies that are concerned with the peaceful use of nuclear energy, the development of appropriate standards for health, safety and international safeguards, and the physical protection of materials and nuclear facilities. The AECB is the body charged with implementing the obligations undertaken by Canada in its agreement with the IAEA for the application of safeguards in Canada. Because of Canada's long-standing support of the IAEA and of the importance attached to its activities, the AECB provides a special nuclear science counsellor to the Canadian Embassy in Vienna, Austria. The AECB is the responsible governmental agency for implementing Canada's bilateral nuclear co-operation agreements through administrative arrangements with its foreign counterparts. The AECB also maintains liaison with regulatory agencies in other countries concerning regulatory and safety matters of mutual interest. As well, the AECB provides advice to Foreign Affairs and International Trade in areas that include nuclear non-proliferation, the export of nuclear items and the safeguarding of nuclear materials.

Canada has signed the International Convention on Nuclear Safety, which came into force in October 1996. The AECB will be responsible for ensuring that Canada fulfils its obligations under this treaty. The AECB is also actively involved in the negotiation of an International Convention on Radioactive Waste Management Safety, which is expected to be available for signing in 1997.

As part of its mandate to ensure that the use of nuclear energy does not pose undue risk to the public or the environment, the AECB must also review accidents or significant events that occur in other countries, and take appropriate actions as necessary with respect to Canadian nuclear facilities.

Intragovernmental and Intergovernmental Arrangements: Certain federal departments, particularly Environment, Health, Transport, Human Resources and Development, Foreign Affairs and International Trade, and Natural Resources have interests in areas closely related to those of the AECB. This, as well as the relation between federal and provincial legislation, plus the need to keep responsibilities clearly defined and to avoid duplication of effort, necessitate continuous discussion on many aspects related to control of nuclear energy. The AECB is playing a lead role in the discussions with the Saskatchewan government relating to the efficiency of the Federation Initiative.

Public Concerns: Public concern is evident about several issues that deal with the use and regulation of nuclear energy. The AECB responds to these concerns by making information available, and by meeting with individuals and groups. Such dialogue is encouraged informally; however, there is also formal provision under a published policy relating to appearances before, and representations to, the Board, as well as staff's participating in public hearings and panels. The Board holds all its meetings in public, and some are held in communities directly affected by licensing decisions. Dealing with public concerns places demands on operational staff due to direct interaction with the public, the provision of explanatory information to the media and interested parties and the review for accuracy of documentation that has been prepared.

Environmental Assessment: The AECB is bound by the *Canadian Environmental Assessment Act (CEAA)*. This Act replaces the *Federal Environmental Assessment and Review Process Guidelines Order* and requires more formal steps for the process, more extensive review of projects by the AECB and mandatory application of Panel recommendations, placing additional demands on resources. We have prepared a first draft of a procedures manual which will be sent to the Canadian Environmental Assessment Agency for review before being finalized for use.

Regulation of Carriers and Shippers: Action on regulating the carriers and shippers of radioactive material has been delayed because the amendments to the *Atomic Energy Control Regulations* have not been completed. New regulations are to be published within three months of the passage of the new *Nuclear Safety and Control Act*.

IAEA Safeguards: The AECB will continue to cooperate with the International Atomic Energy Agency in a joint initiative designed to strengthen the effectiveness of detecting undeclared nuclear activities that would be in violation of the Treaty on the Non-Proliferation of Nuclear Weapons.

Financial Guarantees: Work has continued on definition of acceptable mechanisms for obtaining financial guarantees that will assure that money will be available for appropriate decommissioning of uranium and thorium mining facilities when required. Financial assurances were put in place for one uranium mine in 1996 and it is anticipated that further arrangements will be made in 1997 for other mines. Regulations are being developed to cover all nuclear facilities.

Regulation of Historic Uranium Mines: Preliminary discussions were held with those responsible for several historic uranium mines, including provincial governments. Discussions will continue in 1997, while these mines are maintained in a safe state.

Dosimetry Services: AECB has developed standards which must be met by commercial dosimetry services who wish to offer a service to AECB licensees for the purpose of measuring radiation doses received by workers. The standards are expected to be expanded to satisfy provincial, as well as federal, requirements. The goal is to have one agreed standard for all jurisdictions.

3. Details by Major Activity

Regulation of Reactors and Heavy Water Plants: Figure 7 shows the number of power and research reactor units in operation. No other power reactor units are currently being planned for construction. However, it is anticipated that a construction licence would be granted during the 1997-98 fiscal year for the Medical Isotope Project at Chalk River Laboratories (2 MAPLE reactors and a processing facility). Due to a series of events of safety significance at Pickering during early 1995, and observations by AECB staff that station management was not demonstrating, by example, appropriate consideration for safety, the AECB sent a letter of warning to Ontario Hydro in the fall of 1995 requiring that management demonstrate a rapid improvement in operational safety. AECB staff, through routine inspections and assessments of specific programs and activities, continue to monitor progress in programs planned and implemented by Ontario Hydro to reverse the negative trends and to sustain performance.

Figure 7: Operating Reactors and Heavy Water Plants

	Estimates	Forecast	Actual		
	1997-98	1996-97	1995-96	1994-95	1993-94
Facility	**No. of Units**	No. of Units	No. of Units	No. of Units	No. of Units
Power Reactors	**21**	21	22	22	22
Research Reactors	**11**	11	11	13	13
Heavy Water Plants	**1**	1	1	1	1

Approximately 81 employees in the Directorate of Reactor Regulation will be assigned to maintain regulatory control over reactors and heavy water plants. Twenty-seven of the employees will be project officers who are located at power reactor and heavy water plant sites to monitor operation of the facilities on a day-to-day basis. In addition, inspections, audits and appraisals are conducted by AECB staff from the head office in Ottawa. The number of such activities is shown in Figure 8.

Figure 8: Appraisals/Audits

	Estimates	Forecast	Actual		
	1997-87	1996-97	1995-96	1994-95	1993-94
Power Reactors	**114**	111	98	95	77
Research Reactors	**37**	32	36	21	22
Heavy Water Plants	**2**	1	4	1	1

Regulation of Fuel Facilities and Materials: Figures 9, 10, 11 give a breakdown of the number of nuclear facilities, as well as the number of material licences and transport package design certificates.

Figure 9: Nuclear Facility Licences

	Estimates	Forecast	Actual		
	1997-98	1996-97	1995-96	1994-95	1993-94
Uranium Mines/Mills					
Operating[1]	**5**	5	5	5	4
Development	**3**	4	5	4	4
Decommissioning	**8**	6	6	6	6
Waste Management Facilities					
Operating [1]	**22**	22	23	18	18
Construction	**1**[2]	0	0[3]	1	0
Refineries					
Operating	**3**	3	3	3	3
Fuel Fabrication Plants					
Operating	**3**	3	3	3	3

[1] Malvern site closed in 1996
[2] Irus to be licensed in 1997
[3] Canatom converted from construction to operation in 1995

Figure 10: Nuclear Material Licenses

	Estimates	Forecast	Actual		
	1997-98	1996-97	1995-96	1994-95	1993-94
Prescribed Substances	**32**	31	30	26	35
Radioisotopes	**3,800**	3,795	3,673	3,718	3,743
Particle Accelerators*	**63**	60	60	59	58

* Some licences cover more than one accelerator.

Figure 11: Transport Package Design Certificates

	Estimates	Forecast	Actual		
	1997-98	1996-97	1995-96	1994-95	1993-94
Canadian Certificates					
New and Amended	**14**	12	7	3	12
Renewals	**20**	14	15	18	12
Special Arrangements	**10**	14	11	7	5
	44	40	33	28	29
Foreign Certificates					
New and Amended	**12**	8	3	8	8
Renewals	**10**	18	18	20	11
	22	26	21	28	19
Total	**66**	66	54	56	48

The estimated number of licensing actions and compliance activities that will be carried out is given in Figures 12, 13 and 14.

Figure 12: Prescribed Substance and Radioisotope Licensing Actions

	Estimates	Forecast	Actual		
	1997-98	1996-97	1995-96	1994-95	1993-94
Prescribed Substance Licences					
New Licences Issued	**2**	2	2	3	3
Licences Renewed	**7**	7	16	9	9
Radioisotope Licences					
New Licences Issued	**300**	547	244	220	193
Licences Renewed	**1,900**	1,879	1,636	1,900	1,872

Figure 13: Compliance Inspections

	Estimates	Forecast	Actual		
	1997-98	1996-97	1995-96	1994-95	1993-94
Uranium Mines/Mills*	**175**	161	128	130	104
Waste Management Facilities	**46**	48	44	45	52
Refineries and Fuel Plants	**24**	26	23	26	32
Prescribed Substances	**5**	11	6	21	14
Radioisotopes	**4,000**	2,658	3,079	3,624	3,227
Particle Accelerators	**30**	21	45	34	40
Total	**4,280**	2,925	3,325	3,880	3,469

* Includes decommissioning of uranium mines and tailings.

Figure 14: Number of Licensing Actions

	Estimates	Forecast	Actual		
	1997-98	1996-97	1995-96	1994-95	1993-94
Uranium Mines/Mills					
Removal Licences Renewed	**0**	0	0	1	1
Excavation Licences Renewed	**0**	2	0	0	0
Construction Licences Issued	**2**	0	1	0	0
Operating Licences Issued	**1**	1	1	0	0
Operating Licences Renewed	**3**	1	3	2	2
Decommissioning Licences	**3**	0	0	0	0
Waste Management Facilities					
Construction Approvals Issued	**1**	0	0	0	1
Operating Licences Issued	**0**	0	1	0	0
Operating Licences Renewed	**3**	5	5	5	9
Refineries and Fuel Plants					
Operating Licences Renewed	**3**	3	3	2	2
Particle Accelerators					
Operating Licences Issued	**7**	7	4	1	3
Operating Licences Renewed	**0**	0	1	11	15
Construction Approvals Issued	**5**	5	5	8	1
Construction Approvals Renewed	**0**	0	0	0	0

Research and Support Activities: The Research and Support Program augments and extends activities, undertaken by the AECB, beyond what would be possible with in-house resources. The overall objective of the research and support work is to produce pertinent and independent information that will assist the Board and its staff in making timely and credible decisions related to the regulation of licensed activities. All of this work is contracted out, with the large projects being initiated using the mechanisms of Public Works and Government Services Canada.

Projects undertaken in the program assess issues in the general fields of nuclear reactors, fuel cycle facilities, uranium mines and mills, waste management, dosimetry, health physics, regulations and regulatory process development, and other special services. The projects are organized into sub-program groups, each of which addresses work in theme-related areas. This approach provides focus for the work in each area and enables strategic planning of research over the long term. It also facilitates the structured evaluation of results obtained and the assessment of the use made of funded work done in each project and sub-program area. Required expenditure on Research and Support Program work is estimated to be approximately $3.0 million (excluding salaries) for 1997-98. The proposed costs are shown in Figure 15, with a breakdown being given for the various business areas mentioned above.

Figure 15: Research and Support Program Expenditure ($000)

	Estimates	Forecast	Actual		
	1997-98	1996-97	1995-96	1994-95	1993-94
Nuclear Reactors	**1,650**	1,644	1,530	1,758	1,474
Uranium Mines/Mills	**300**	191	176	320	642
Other Fuel Cycle Facilities	**200**	153	361	234	379
Waste Management	**200**	348	260	153	247
Non-fuel Cycle Applications	**100**	33	90	169	51
Transportation	**100**	0	0	6	1
Health Physics	**250**	283	266	382	360
Regulations and Regulatory Process Development	**50**	112	126	65	138
Special Services	**150**	184	220	167	71
Total	**3,000**	2,948	3,029	3,254	3,363

The expenditures incurred in 1995-96 provided for work on 118 projects of which 54 were completed during the fiscal year. There are 125 projects planned for 1996-97, and the number of projects for 1997-98 is expected to be similar. In 1995-96, 14 FTEs were assigned to these activities; four FTEs will be assigned during 1996-97 and 1997-98.

Early in 1996-97, a new process was introduced for management of work in the Research and Support Program. The change was meant to streamline the way in which work in the program is managed and in so doing to reduce the overhead cost of the program. Responsibility for management of the technical aspects of work done in the program now rests with the individual clients of the program. Project administration and contracting is handled by the Finance Division; a Research Section comprising of four employees has been assigned the responsibility for program planning and management. A peer review committee has been established to review and approve annual research program proposals, proposals for new projects during each year and the annual report on work done in the program.

Non-proliferation, Safeguards, Safeguards Support and Security Activities: The AECB ensures that Canadian nuclear facilities comply with international safeguards and physical security requirements. It issues export and import licences for prescribed substances and nuclear items in a manner consistent with national legislation and Canada's nuclear non-proliferation policy. The AECB also participates in and assists international activities to limit the spread of nuclear weapons. The Canadian Safeguards Support Program assists the International Atomic Energy Agency (IAEA) by providing technical assistance and other resources, and by developing equipment to improve the effectiveness of IAEA safeguards. These activities are detailed below.

Nuclear Non-proliferation: The AECB ensures that Canada's exports and imports of nuclear materials, equipment and technology are licensed pursuant to the *Atomic Energy Control Act* and the *Atomic Energy Control Regulations*, and in accordance with Canada's multilateral nuclear non-proliferation commitments as a signatory of the Treaty on the Non-Proliferation of Nuclear Weapons, including the Zangger Committee and the Nuclear Suppliers Group guidelines. The AECB also implements, through interagency administrative arrangements negotiated with its foreign

counterparts, the nuclear non-proliferation provisions of Canada's 22 signed bilateral nuclear cooperation agreements, covering 37 countries, without hampering the legitimate economic and technological development of the parties to these agreements. As well, the AECB provides advice to the Minister of Natural Resources, as appropriate, and Foreign Affairs and International Trade on issues concerning the negotiation and interpretation of bilateral nuclear cooperation agreements, the development and application of Canada's nuclear non-proliferation and export policies, and multilateral issues associated with the international nuclear non-proliferation regime. In 1995-96, six AECB FTEs were assigned to these activities; seven FTEs will be assigned during 1996-97 and nine FTEs in 1997-98.

Figure 16: Nuclear Export and Import Licences

	Estimates	Forecast	Actual		
	1997-98	1996-97	1995-96	1994-95	1993-94
Export Licences	**600**	500	465	481	323
Import Licences	**500**	450	424	257	175

Nuclear Material Safeguards: The AECB administers the agreement between Canada and the International Atomic Energy Agency (IAEA) for the application of safeguards in Canada [INFCIRC 164], the exclusive purpose of which is the verification of Canada's safeguards obligations under the Treaty on the Non-Proliferation of Nuclear Weapons. The AECB ensures that Canadian nuclear facilities comply with both the international safeguards requirements and the safeguards-relevant provisions of the *Atomic Energy Control Act.* This is accomplished through a system of nuclear material accountancy and physical verification of safeguarded nuclear materials (i.e. uranium, plutonium and thorium).

AECB staff maintain a comprehensive database of all safeguarded nuclear material that is located in Canada or shipped across its borders, and submits reports to the IAEA on all transactions involving safeguarded nuclear material. Figure 17 summarizes the disposition of these reports. AECB staff interface with IAEA inspectors to facilitate effectively the conduct of independent inventory verification in the interests of Canada's commitment to the IAEA. Furthermore, the AECB participates at all levels (facility, national, international) in discussions pertaining to the safeguarding of nuclear materials. In 1995-96, seven FTEs were assigned to these activities; nine FTEs will be assigned during 1996-97 and 1997-98.

Figure 17: Canadian Nuclear Material Under IAEA Safeguards

	Estimates	Forecast	Estimate	Actual		
	1998*	1997*	1996*	1995	1994	1993
Reports Filed	**680**	670	660	646	649	657
Transactions	**21,000**	20,000	19,000	18,942	18,580	16,619
Tonnes of Material**	**33,000**	32,000	30,000	29,448	27,065	25,878

Note: data is reported by calendar year as per IAEA reporting convention

* estimate

** nuclear material subject to IAEA verification activities

Canadian Safeguards Support Program: Since 1976, Canada has undertaken a safeguards research and development program to supplement the resources of the International Atomic Energy Agency (IAEA) and of the AECB in resolving specific safeguards concerns. This program is delivered by the AECB through the Canadian Safeguards Support Program (CSSP). All tasks in support of the IAEA are initiated by the IAEA through a formal request and approval procedure, and are carried out under contract. The CSSP undertakes tasks as categorized in Figure 18. Equipment development includes projects such as development and installation of a new generation of spent fuel bundle counters and core discharge monitors, digital and remote surveillance systems, nuclear material sealing systems and nuclear fuel verifiers. Successful solutions to safeguards problems must be affordable, reliable, maintainable, offer low intrusion to the nuclear operator and reduce the demand on IAEA inspectors. In 1996-97, there were 38 major tasks in progress. Required expenditure in 1997-98 is estimated to be $2.8 million (excluding salaries and minor capital). In 1995-96, 4.5 FTEs of effort were assigned to these tasks; in 1996-97, 4.5 FTEs of effort will again be available. In 1997-98, 5 FTEs will be assigned.

Figure 18: Canadian Safeguards Support Program Costs by Task Category ($000)

	Estimates	Forecast	Actual		
Task Category	**1997-98**	1996-97	1995-96	1994-95	1993-94
Equipment Development	1,700	1,592	1,745	1,879	2,311
System Studies	150	165	152	108	18
Staffing Assistance/Training*	750	768	526	503	553
Miscellaneous	80	111	33	6	7
Program Management Costs	120	105	122	121	4
	2,800	2,741	2,578	2,617	2,893

* Cost-free experts and IAEA travel and training in connection with CSSP tasks

Physical Security: The AECB ensures the development and implementation by licensees of effective physical protection measures for Canadian nuclear facilities and nuclear material in accordance with regulations made pursuant to the *Atomic Energy Control Act.* The AECB, in conjunction with Foreign Affairs and International Trade (FAIT), ensures that measures for the physical protection of nuclear facilities and nuclear materials in Canada are consistent with Canada's international obligations, specifically the Convention on the Physical Protection of Nuclear Materials. Additionally, the AECB provides advice and assists FAIT in international matters regarding the security of nuclear facilities and nuclear materials.

In 1995-96, among other security activities, 10 in-depth security assessments were carried out at Canadian nuclear facilities to verify compliance with the *Physical Security Regulations*. A number of follow-up post-assessment consultations were undertaken to ensure that appropriate corrective actions were taken by licensees. In 1996-97, 13 security assessments have been planned. Additionally, two international assessments will be carried out at the request of the IAEA, one in Bulgaria and one in Slovenia. In 1995-96, two FTEs were assigned to these activities; two FTEs will be assigned during 1996-97 and three FTEs in 1997-98.

4. Other Information

Description of the AECB Comprehensive Licensing System: The AECB achieves its mission through a comprehensive licensing system that covers all aspects of nuclear facilities, and prescribed substances and equipment, including the certification of domestic and foreign transport package designs, to assure that such facilities, substances and equipment are utilized with proper consideration of health, safety, security and protection of the environment. The licensing system is administered with the co-operation of other federal and provincial departments in such areas as health, environment, transport and labour. This enables the concerns and responsibilities of these departments to be taken into account before licences are issued by the AECB.

The AECB's mission also extends to the import and export of prescribed substances, equipment and technology. It reflects Canadian participation in the activities of the International Atomic Energy Agency and compliance with the requirements of the Treaty on the Non-Proliferation of Nuclear Weapons. It covers both domestic and international security of nuclear materials and technology.

There are three types of licences issued by the AECB: nuclear facility licences, nuclear material licences and import/export licences.

Nuclear Facility Licences: By definition in the *Atomic Energy Control Regulations,* nuclear reactors, sub-critical nuclear reactors, particle accelerators, uranium and thorium mines and mills, plants for the separation, processing, reprocessing or fabrication of fissionable substances, plants for the production of deuterium or deuterium compounds, and facilities for the disposal of prescribed substances are nuclear facilities and as such can be operated only in accordance with a licence issued by the AECB.

Before the AECB issues a licence to operate a facility, the applicant must meet criteria established by the AECB for the siting, construction and operating stages. The AECB evaluates information that is provided by the applicant in support of the application concerning the design, and the measures to be adopted to ensure that the facility will be constructed and operated in accordance with acceptable levels of health, safety, security and the environment. Throughout the lifespan of the facility, the

AECB monitors its operation to verify that the licensee complies with the relevant regulations pursuant to the *Atomic Energy Control Act*, and with the terms and conditions of the licence.

At the end of its useful lifespan, the facility must be decommissioned in a manner that is acceptable to the AECB and, if required, the facility site must be restored for unrestricted use or managed until the site no longer presents a hazard to health, safety, security or the environment.

Nuclear Material Licences: There are two types of licences for nuclear materials: Prescribed Substances Licences for uranium, thorium, radium and heavy water; and Radioisotope Licences for radioisotopes that are widely used in medicine for diagnostic and therapeutic purposes, and in industry for radiography, gauging, static elimination, oil well logging and industrial irradiators. Licences are issued for the use or possession of these nuclear materials.

The use of nuclear materials, radioisotopes in particular, is widespread across Canada. In order to ensure that the materials are transported safely, it is the responsibility of the AECB to regulate and approve the packaging of such materials for shipment. The design of domestic and foreign transport packages that transport hazardous quantities of radioactive prescribed substances is licensed for use after an engineering evaluation of a user's application is carried out. The regulation of the transportation itself is a shared responsibility with other government agencies.

All licences are issued for a limited period of time, normally one to two years, being renewed on evidence that operation or use continues to be satisfactory. Certificates for transport package designs are issued for a limited period of time and can be renewed subject to review. After licences and certificates have been issued, the AECB inspects to ensure compliance with the *Atomic Energy Control Regulations,* the *Transport Packaging of Radioactive Materials Regulations*, the *Uranium and Thorium Mining Regulations*, the *Physical Security Regulations*, and the terms and conditions contained in licences and certificates.

Import/Export Licences: The *Atomic Energy Control Act* provides for the establishment of regulations which, in particular, relate to imports and exports associated with the production, use or application of atomic energy. Sections 5 and 7 of the *Atomic Energy Control Regulations* set out the requirements for licences to import and/or export certain items.

A licence is required to export any prescribed substances or any prescribed item. Prescribed substances as defined in the *Atomic Energy Control Act* include uranium, thorium, plutonium, neptunium and deuterium. Prescribed items as defined in the regulations include items designated in Group 3 and Group 4 of the *Export Control List* made pursuant to the *Export and Import Permits Act.* A licence is required to import any prescribed substance.

Public Input: The public and interested parties may receive information and/or have an input into the licensing process through: the communications program the AECB requires of an applicant for a major facility; the notice of intent to establish a facility, issued by the AECB; a hearing under federal or provincial environmental jurisdiction, if called for; representations and appearances before the Board under its policy on participation by interested parties; and/or publicity arising from news media coverage of any of the foregoing. There is considerable opportunity for public input where the licence decision-making process links with the environmental assessment process. The public also has an input into the setting of the regulatory requirements applied in licensing, through a consultation process permitting comment on proposed regulations, policy statements, and guides.

Enforcement: The *Atomic Energy Control Act* and regulations made pursuant to it provide for revocation, suspension or amendment of a licence, or any combination of these three mechanisms, depending on the circumstances. As well, the *Atomic Energy Control Act* provides for fines and imprisonment on summary conviction or upon indictment on a finding of guilt.

Revenue: The Atomic Energy Control Board endeavours to recover its costs, with the exception of costs related to international safeguards, import/export activities, and regulation of other federal departments, hospitals and educational institutions. The AECB's costs are recovered in the form of fees for licences to operate nuclear facilities, and licences to use and possess nuclear materials. These fees have been established under the *Atomic Energy Control Act* and all revenues derived from the collection of these fees are credited directly to the Consolidated Revenue Fund and are not available for use by the AECB. Figure 19 provides a listing of revenue generated by the AECB.

Figure 19: Revenue by Licensing Activity ($000)

Licensing Activity	**Estimates 1997-98**	Forecast* 1996-97	Actual 1995-96
Nuclear Reactors and Heavy Water Plants	**22,830**	23,377	18,038
Research Reactors	**16**	16	16
Nuclear Research and Test Establishments	**1,480**	1,727	1,113
Uranium Mines	**3,180**	3,463	2,514
Nuclear Fuel Facilities	**851**	851	851
Prescribed Substances	**88**	88	77
Accelerators	**111**	111	96
Radioisotopes	**3,144**	3,705	2,204
Transportation	**68**	68	96
Waste Management and Decommissioning	**1,395**	1,360	1,166
Dosimetry	**20**	20	20
Total Revenue	**33,183**	34,786	26,191

Note: All revenues are expressed on a cash basis.

* The figures for fiscal year 1996-97 reflect the fee schedule which became effective August 12, 1996.

Section III
Departmental Performance

A. Summary of Departmental Performance

- The AECB investigated means for obtaining services from other federal government departments on a sound contractual basis.

- The AECB carried out extensive inter-departmental and federal-provincial consultation as preparatory work for a proposal for new legislation. New legislation was ready for consideration early in 1996.

- Emergency planning is an essential component of any comprehensive nuclear power program. In Canada, a matrix of federal departments (and provincial ones) would be involved if a nuclear emergency were to occur. The responsibilities of each, and particularly the role and responsibility of the AECB in such a matrix has been reviewed in 1996-97 and documented in a new Emergency Response Plan.

- The AECB continued, outside its normal regulatory program, to review designs submitted by Atomic Energy of Canada Limited (AECL) for the new CANDU 9 reactor to verify whether it would be licensable in Canada. AECL hopes to build the first CANDU 9 in Korea. The full cost of this activity is being recovered from AECL.

- As part of its program of interaction with the public, the AECB has started wide distribution of periodic reports, easily read by non-technical readers, concerning the safety status of nuclear installations. Also, the AECB produced an educational video on "Radiations and Our Environment". These efforts at improving communication with the public has continued in 1995-96.

- Following the unsuccessful challenge on the *Nuclear Liability Act* (NLA) by Energy Probe and others, an appeal was launched. Discussions between the parties on the issue of costs lead to the withdrawal of the appeal in 1996. A review of the NLA is underway under the leadership of Natural Resources Canada, with the AECB as a participant.

- Canada was one of the first countries to sign the Treaty on the Non-Proliferation of Nuclear Weapons (the Treaty). Since then, the AECB has worked closely with Foreign Affairs and International Trade (FAIT), and with the International Atomic Energy Agency (IAEA), in the Treaty's implementation. During 1994-95, the AECB and the IAEA commenced trials of new procedures for detecting clandestine activities that would be in violation of the Treaty. In 1995-96, the Treaty expired. The AECB and the IAEA continued in 1995-96 with trials of new procedures aimed at strengthening the IAEA safeguards system. The AECB actively participated on the Canadian delegation which contributed significantly to the decision in May 1995 by the States Party to extend the Treaty indefinitely. This decision is a major and historic one not only for arms control and disarmament but also for maintaining the foundation of peaceful nuclear trade and cooperation.

- The increased resources allocated to the AECB in 1992, have continued to be used to improve regulatory effectiveness in a number of areas of responsibility. Examples of such improvements include the following.

  - More detailed reviews by AECB staff of safety analyses submitted by nuclear power plant licensees in support of their applications for operating licences. These analyses use complex computer code to predict the consequences of hypothetical accidents in various reactor systems (for example a pipe rupture in the reactor cooling circuit). AECB's review of these codes has revealed major shortcomings. Some have been corrected by the licensees but significant additional regulatory effort is needed to ensure further improvement in this area.

  - Further progress is being made in improving the regulatory process for reviewing the training and qualifications of operators at nuclear power plants. In consultation with licensees, efforts were devoted to reduce the number of examinations administered by the AECB.

  - A more thorough examination of generic safety issues (in particular those related to the ageing of nuclear installations).

  - Improvements in nuclear power plant compliance program activities to achieve better consistency and effectiveness of inspectors' work.

  - Developing the foundations for a comprehensive training program for nuclear power plant project officers.

  - A better coordination between the various federal and provincial departments that would have to be involved in the event of an accident in a nuclear installation.

  - A more comprehensive program for inspecting radioisotope users (there are about 3,800 radioisotope users in Canada).

  - More detailed audits of radiation protection and quality assurance programs in uranium mines and refineries.

  - More extensive participation in environmental review processes (most of which required by the *Canadian Environmental Assessment Act*).

- The AECB and Human Resources Development Canada (HRDC) have commenced discussions with the Province of Saskatchewan to attempt to reach agreement on a mechanism to allow the Province of Saskatchewan to administer the program for regulating conventional health and safety in Saskatchewan uranium mines.

- Canada has assumed a lead role in the development of an international convention on radioactive waste management with a member of AECB staff leading the Canadian delegation.

- In August 1995, the AECB began a major project aimed at providing detailed recommendations for improvements in the institution's regulatory and management practices. The project was completed and all recommendations submitted for executive consideration and approval in June 1996. Once the recommendations are approved the work to implement them and establish the improvements will commence.

Figure 20: Use of 1995-96 Authorities - Volume II of the Public Accounts

Vote	(dollars)	Main Estimates	Total Available for Use	**Actual Use**
	Atomic Energy Control Board			
35	Program Expenditures	38,726,000	43,194,000	**39,088,221**
(S)	Spending of proceeds from the disposal of surplus Crown Assets	-	22,655	-
(S)	Contributions to employee benefit plans	3,248,000	3,411,000	**3,411,000**
	Total Program-Budgetary	41,974,000	46,627,655	**42,499,221**

B. Departmental Overview

The AECB has signed a contract with Atomic Energy of Canada Limited (AECL) to review the technology that AECL wishes to sell to foreign countries and to give a formal opinion to AECL on whether there appears to be any major impediments to its being licensable in Canada. The full cost of this activity is being recovered from AECL.

In August 1995, the AECB began a major Project aimed at providing detailed recommendations for improvements in the institution's regulatory and management practices. Recommendations were submitted for executive consideration in June 1996. The AECB's executive is working on these and is implementing those that are approved. This is a gradual process which will continue into 1997-98. The result will be an important contribution to the establishment of improved management processes for the AECB and an up-to-date, business-like operation for the long-term.

The *Atomic Energy Control Regulations* specify the maximum radiation exposure levels considered acceptably safe for atomic radiation workers and the public. The AECB has carried out public consultation on proposals to change these exposure limits to conform to recent international findings that the former limits might not be sufficiently restrictive. The new regulations have gone through an extensive public consultation process and are now waiting for the approval of the *Nuclear Safety and Control Act* by Parliament.

The AECB's regulatory effort aimed at ensuring safe operations in all aspects of the nuclear industry is ongoing. In 1995-96, the AECB began the implementation of the results of recent studies to improve the effectiveness of licensing, inspection and enforcement procedures at nuclear power plants. The phased implementation has continue in 1996-97 and will be further implemented in 1997-98.

The AECB continued to participate in environmental reviews of the disposal concept for nuclear fuel wastes, new uranium mines in Saskatchewan and the decommissioning of shut-down uranium mines in Ontario. Four new uranium mines in Saskatchewan are expected to commence operation in the next five years. Five of six operating mines in the Elliot Lake area of Ontario have closed and are being decommissioned. The sixth mine has announced its closure in 1996. The Cigar Lake, Midwest and McArthur River projects will undergo public review by a panel in 1996. The McClean Lake project is under construction, and has received approval to mine the JEB pit. Procedures will be developed for having such environmental reviews performed in accordance with the new regulations made under the *Canadian Environmental Assessment Act*, rather than with the Environmental Review Process Guidelines Order as in the past.

The primary responsibility for safety in operating a nuclear facility lies with the licensee. The AECB's regulatory role is to ensure that licensees are discharging that responsibility adequately, in order that Canadian workers, members of the public, and the environment be adequately protected. To a degree, the effectiveness of the AECB regulatory program is measurable by the extent to which workers and the public are exposed to radiation. This exposure record also reflects, of course, the effectiveness of licensees' programs. It should be noted, however, that the non-occurrence of significant events or overexposures, especially during a limited time frame, does not constitute a definite demonstration of safety. Consequently, information on radiation exposures should be taken as an indicator of safety performance rather than as an absolute measure.

During the reporting period, all nuclear power stations operations were such that radiation exposures of members of the public in the surrounding area was less than 1% of the annual dose limit.

C. Details by Business Line

1. Financial Performance

Figure 21: 1995-96 Financial Performance ($000)

Licensing Activity	1993-94 Actual	1994-95 Actual	1995-96 Actual	1995-96 Main Estimates	**Change**
Nuclear Reactors and Heavy Water Plants	25,591	24,661	25,009	27,083	**(2,074)**
Research Reactors	243	461	420	258	**162**
Nuclear Research and Test Establishments	1,893	1,654	1,682	2,004	**(322)**
Uranium Mines	4,132	3,281	3,427	4,373	**(946)**
Nuclear Fuel Facilities	1,059	890	866	1,121	**(255)**
Prescribed Substances	185	154	233	195	**38**
Accelerators	304	303	338	321	**17**
Radioisotopes	7,188	6,325	6,834	7,608	**(774)**
Transportation	151	215	527	159	**368**
Waste Management and Decommissioning	1,410	1,362	1,651	1,492	**159**
Import/Export	164	141	176	174	**2**
Dosimetry	53	259	368	56	**312**
Non-licensing activities	2,323	3,252	6,082	2,445	**3,637**
Gross Cost of Operations	44,696	42,958	47,613	47,289	**324**
Services Provided Without Charge from OGD	(2,419)	(1,865)	(5,114)	(5,310)	**196**
Spending of Proceeds from Crown Assets Disposal	(14)	-	-	(5)	**5**
Net Cost of Operations to the AECB	42,263	41,093	42,499	41,974	**525**

Explanation of Change: Actual financial requirements for 1995/96 were $525,000 or 1.3% higher than the Main Estimates. This was due to:

	($000s)
• CANDU 9 review project costs	1,362
• Increase in statutory costs and services provided without charge	364
• Operational costs higher than anticipated	239
• Travel lower than anticipated	(552)
• Foreign Training costs lower than anticipated	(388)
• Canadian Safeguards Support Program costs lower than anticipated	(213)
• Research project costs lower than anticipated	(171)
• Inspection costs for Ontario uranium mines lower than anticipated	(116)

2. Initiatives for 1995-96

The following initiatives were undertaken by the AECB in 1995-96:

- continued trials in Canada, in cooperation with the IAEA, of alternative approaches to safeguards activities, in order to test the cost effectiveness of current procedures as well as possible new procedures for detecting undeclared nuclear activities;

- chaired the Technical Working Group of the International Nuclear Suppliers' Group, in a new undertaking aimed at defining "technology" as it applies in controlling the export of nuclear items of proliferation concern;

- established mechanisms for obtaining financial guarantees for nuclear facilities so that money will be available for appropriate decommissioning of the facilities at the end of their useful life;

- took steps to bring under the Atomic Energy Control regulatory regime, uranium mine sites that ceased to be productive before the AECB started regulating uranium mining; this will ensure adequate ongoing environmental protection around these sites;

- continued the development of a process for certifying operators of radiation dosimetry services to ensure adequate dosimetry services are available to Canadians; procedures have been developed to assess operators of services that measure radiation doses external to the body; there is a need to develop similar procedures to assess services that estimate doses from radionuclides taken into the body;

- developed standards which must be met by commercial dosimetry services who wish to offer a service to AECB licensees for the purpose of measuring radiation doses received by workers; one commercial service was approved in 1995; in 1995-96 two others are expected to seek approval; the standards are expected to be expanded to satisfy Provincial and Federal requirements with the ultimate goal to have one agreed standard for all jurisdictions.;

- a draft revision of the *Physical Security Regulations* has been completed; in addition other revisions are under consideration and have been the subject of discussions with stake holders during 1995-96;

- accelerated the Cost Recovery program towards recovering 100% of all recoverable costs; and

- implementation of the results of recent studies to improve the effectiveness of licensing, inspection and enforcement procedures at nuclear power plants focussed on the development of consistent and comprehensive compliance inspection procedures for special safety systems and on the development of a set of indicators that will give an objective measure of the safety performance of nuclear power reactor operators. The power reactor divisions were also involved in the development of a corporate compliance program policy.

Figure 22: 1995-96 Financial Summary ($000)

Licensing Activity	Actual Expenditures 1995-96	Actual Revenue 1995-96	Difference
Nuclear Reactors and Heavy Water Plants	25,009	18,038	6,971
Research Reactors	420	16	404
Nuclear Research and Test Establishments	1,682	1,113	569
Uranium Mines	3,427	2,514	913
Nuclear Fuel Facilities	866	851	15
Prescribed Substances	233	77	156
Accelerators	338	96	242
Radioisotopes	6,834	2,204	4,630
Transportation	527	96	431
Waste Management and Decommissioning	1,651	1,166	485
Import/Export	176	-	176
Dosimetry	368	20	348
Non-licensing Activities	6,082	-	6,082
	47,613	26,191	21,422

Section IV
Supplementary Information

1. Financial Requirements

Figure 23: Financial Requirements by Object ($000)

	Estimates 1997-98	Estimates 1996-97	Actual 1995-96
Personnel			
Salaries and Wages	**23,442**	24,733	23,914
Contributions to Employee Benefit Plans	**4,107**	3,690	3,411
Other Personnel Costs	**717**	717	677
	28,266	29,140	28,002
Goods and Services			
Transportation and Communication	**4,024**	3,888	3,570
Information	**433**	390	433
Professional and Special Services	**6,760**	8,281	7,184
Rentals	**250**	108	130
Purchased Repair and Maintenance	**481**	179	388
Utilities, Materials and Supplies	**709**	670	731
Other Subsidies and Payments	**1**	1	27
	12,658	13,517	12,463
Total Operating	**40,924**	42,657	40,465
Minor Capital	**661**	661	1,394
Transfer Payments	**658**	605	640
Total Requirements	**42,243**	43,923	42,499

Figure 24: 1997-98 Resources by Organization and Distribution by Licensing Activity ($000s)

Functional Unit/ Licensing Activity	Directorate of Reactor Regulation	Directorate of Fuel Cycle and Materials Regulation	Directorate of Analysis and Assessment	President's Office and Secretariat	Directorate of Administration	Total
Nuclear Reactors and Heavy Water Plants	5,935	1,255	4,816	5,291	7,551	24,848
Research Reactors	147	32	73	66	100	418
Nuclear Research and Test Establishments	351	131	304	489	396	1,671
Uranium Mines	85	1,086	393	599	1,242	3,405
Nuclear Fuel Facilities	27	322	121	130	261	861
Prescribed Substances	7	114	17	26	68	232
Accelerators	11	182	23	34	85	335
Radioisotopes	223	3,557	477	686	1,847	6,790
Transportation	17	277	32	65	132	523
Waste Management and Decommissioning	48	729	174	167	522	1,640
Import/Export	12	45	16	204	88	365
Dosimetry	6	8	100	17	44	175
Non-Licensing Activities	889	380	1,277	1,147	2,350	6,043
Total Cost	7,758	8,118	7,823	8,921	14,686	47,306
Services Provided Without Charge by Other Government Departments	(994)	(1,070)	(960)	(886)	(1,153)	(5,063)
Total Estimates	6,764	7,048	6,863	8,035	13,533	42,243

2. Personnel Requirements

Personnel expenditures account for 67% of the total expenditures of the Program. A profile of the Program's personnel requirements is provided in Figure 25.

Figure 25: Details of Personnel Requirements

	Actual 1994-95	Actual 1995-96	1996-97 Estimates	1997-98 Estimates	1998-99 Estimates	1999-00 Estimates
Order in Council Appointment	1	1	1	1	1	1
Executive	27	27	27	28	28	28
Scientific, Technical and Professional	289	303	302	290	290	290
Administrative Support	80	77	67	82	82	82
Total	397	408	397	401	401	401

Note: Full-time equivalent (FTE) is a measure of human resource consumption based on average levels of employment. FTE factors out the length of time that an employee works during each week by calculating the rate of assigned hours of work over scheduled hours of work. FTEs are not subject to Treasury Board control but are disclosed in Part III of the Estimates in support of personnel expenditure requirements specified in the Estimates.

3. Transfer Payments

Figure 26: Details of Grants and Contributions

	Estimates 1997-98	Forecast 1996-97	Actual 1995-96
Grants			
Grants to support non-profit organizations that are furthering the development of nuclear safety standards	**15,000**	15,000	14,500
Contributions			
Contribution to the International Biospheric Validation Study (BIOMOVS)	**-**	-	77,240
Contribution to the Swedish Radiation Protection Institute in support of the International Symposium on Ionizing Radiation: Protection of the Natural Environment	**-**	-	10,000
Contributions for the Cost-Free Manpower Assistance Program and to procure related goods and services required to execute the Canadian Support Program for the International Atomic Energy Agency	**550,000**	550,000	497,850
Contribution to the International Agency for Research on Cancer in support of the International Collaborative Study of Cancer Risk among Nuclear Industry Workers	**40,000**	40,000	40,000
Contribution to the Swedish Nuclear Power Inspectorate in support of the DECOVALEX II Project	**37,000**	-	-
Contribution to the University of Illinois at Urbana-Champaign in support of the Information System of Occupational Exposure (ISOE)	**16,000**	-	-
	643,000	590,000	625,090
	658,000	605,000	639,590

References

Atomic Energy Control Act, R.S.C., 1985, Chapter A-16

Nuclear Liability Act, R.S.C., 1985, Chapter N-28

Atomic Energy Control Regulations, C.R.C., 1978, Chapter 365

Physical Security Regulations

Uranium and Thorium Mining Regulations

Transport Packaging of Radioactive Materials Regulations

Atomic Energy Control Board *ANNUAL REPORT* 1995-96, Cat. No. CC 171-1996; ISBN 0 662-62436-X

CONTROL An Introduction to the Atomic Energy Control Board, INFO-0125/Rev 2

REPORTER, published quarterly, ISSN 0835-5975, Atomic Energy Control Board

PUBLICATIONS CATALOGUE, January 15, 1996, Atomic Energy Control Board

More information about the AECB and its Program is available, free of charge, from:

Office of Public Information
Atomic Energy Control Board
280 Slater Street
Ottawa, Ontario K1P 5S9

Telephone:
(613) 995-5894 or
1-800-668-5284
Fax:
(613) 992-2915

Index