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Safety Commission

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de sûreté nucléaire

Research and Support Program 2003-2004 Performance Report



June 14, 2004

**RESEARCH AND SUPPORT PROGRAM
2003-2004 PERFORMANCE REPORT**

**Prepared by
Regulatory Standards and Research Division
Directorate of Operational Strategies**

June 14, 2004

Executive Summary

The Canadian Nuclear Safety Commission funds an extramural Research and Support Program (Program) to obtain knowledge and information needed to support its regulatory mission. The Program gives access to independent advice, expertise and experience through contracts placed in the private sector and with other agencies and organizations in Canada and elsewhere. The Program is compiled by the Regulatory Standards and Research Division (RSRD) from project proposals submitted by clients across the CNSC.

During fiscal year 2003-2004, a budget of \$2,320 K was originally allocated to the Program (including \$300 K in special security funding). On several occasions during the year, RSRD returned funds thereby decreasing the Program budget to \$1,649 K. The Program over-expended with actual expenditures of \$1,751 K. After taking into consideration the \$81 K cost-recovered from external third parties, the Program's over-expenditure was only \$21 K.

The original Program plan was to fund fifty-two projects, of which thirty-one (including unexpected carryovers) had been in-progress at the start of the year. Changes during the year resulted in a final Program consisting of sixty-eight projects being active, thirty-three of which were completed.

Careful monitoring of the Program resulted in no funds being lapsed for the first time in many years; so financial management of the program can be deemed a success. According to reviews by proponents of the effectiveness of completed projects, the CNSC also received good value for its money. Twenty-seven of the twenty-nine evaluations rated the quality of the final report as Very Good or Excellent.

Introduction

Each year, the CNSC funds an extramural Research and Support Program (Program) whose mandate is to generate knowledge and information to support CNSC staff in its regulatory mission. The Program provides access to independent advice, expertise and experience through contracts placed in the private sector and with other domestic or international agencies.

The annual Program is compiled from project proposals made prior to the start of the fiscal year. Proponents define their specific needs for contracted-out research or support work, provide justification for the proposed work and outline the intended use of the results. The Regulatory Standards and Research Division (RSRD) staff compiles the draft Program and submits it for review and approval to the Research and Support Committee (RSC). The RSC decides which proposals to recommend for funding based on merit, corporate strategies and priorities and the specific Program objective. The RSC then advises the Operations Management Committee (OMC) on the funding requirement for the Program. The extent to which the work can be completed depends on the funding allocated.

Subject to availability of funds, new project proposals may be considered for funding at any time during the annual program cycle.

To initiate work on an approved project, the client division prepares a Statement of Work and either a sole source justification or criteria for evaluation of proposals. The Senior Research Program Officer, RSRD, provides assistance to the proponent and is responsible for the review and final approval of the completed Contract Request Form. A Contracts Officer prepares the

supporting documentation and forwards the Request for Proposals to Public Works and Government Services Canada (PWGSC) or advertises directly on MERX (the government's on-line open bidding service at www.merx.com) in accordance with Treasury Board policy. Proposals received from potential contractors are evaluated by the client division and the Senior Research Program Officer. The contracts officer (PWGSC or CNSC) then prepares and issues the contract.

Once a contract is awarded, the proponent is responsible for project management, including arranging meetings, reviewing deliverables, certifying invoices, and ensuring that the contractor meets the objectives specified in the Statement of Work. The Senior Research Program Officer is responsible for arranging contract amendments requested by the client division and for performance of other non-technical work associated with the contract. On completion of the project, the client division reviews and accepts the final report produced by the contractor.

Finally, public reports from the Program are allocated an RSP number by the Research Program Assistant, RSRD, and listed in the on-line CNSC Documents Catalogue. Copies of these reports are provided on request to staff, interested stakeholders and the public.

Table of contents

Executive Summary	i
Introduction.....	i
1 Objectives and Organization of the Program.....	1
2 Program Performance	2
2.1 Fiscal Performance.....	2
2.1.1 Project Initiation.....	2
2.1.2 Project Schedule.....	3
2.1.3 Carryovers.....	3
2.2 FY 2003-2004 Expenditures	3
2.3 Comparison with Previous Years.....	4
2.4 Program Effectiveness Review	5
3 Conclusion	5
Table 1 - Breakdown of Expenditures	7
Table 2 - Financial Comparison with Previous Years	7
Appendix A: Projects Completed in Fiscal Year 2003-2004.....	9
Appendix B: Reports Issued in Fiscal Year 2003-2004.....	13

1 Objectives and Organization of the Program

Since the CNSC's planning horizon had been increased from one year to two, to make it consistent with the Strategic Planning and Budget Planning Processes, a two year "Call for Proposals" was issued on November 26, 2002.

The mandate of the Program, to generate knowledge and information to support CNSC staff in its regulatory mission, remained unchanged; however the objectives were changed slightly from the previous year. The specific objectives, as listed in the call letter, were:

- X to address issues raised by Central Government Agencies (such as the Office of the Auditor General);
- X to support regulatory decision-making or refine a staff position;
- X to contribute to the independence of the regulator;
- X to address problems of potential safety significance;
- X to supplement staff's knowledge with specialist expertise
- X to induce a licensee to address an issue; and
- X to work towards an Operations Branch Strategic Priority.

The demand for research and support work for the new Program years was low compared to previous years with only thirty-three new proposals being received. Of the new requests, five were projects that had been approved at Level 1 in the 2002-2003 Program and never initiated and three were for 2004-2005. There were also twenty-two planned carryovers from the 2002-2003 Program, one of which was an approved Level 1 project that failed to find a successful contractor on the first RFP attempt and was to be reissued (R131.1).

The Research and Support Committee began preliminary program discussions at its January 6, 2003 meeting, continued on January 27, 2003 and finalized the Program at its February 28, 2003 meeting. After the final decision meeting, the Program received four new proposals and had seven projects from the 2002-2003 Program unexpectedly carryover. The final disposition of the proposals/projects for the 2003-2004 Program was as follows:

In-progress (from FY02/03) projects:	22	
Unexpected carryovers (from FY02/03):	7	
Level 1 approved (immediate initiation):	21	includes R131.1
Level 2 approved (in principle):	6	
On Hold:	2	
New:	2	+ 2 still waiting decision
Rejected:	2	

The fifty-two projects with approved funding had a total budget requirement of approximately \$1,822 K. Surplus funds of approximately \$500 K were not returned to corporate coffers on the expectation that significant new work was in the pipeline (e.g. on the licensing basis for the Advanced CANDU Reactor (ACR) review).

In September 2003, \$200 K was released from the general funds to the Operations Branch central budget. In October, \$100 K of security funds was returned to Finance for redistribution. In December, RSRD released \$50 K of general funds and \$19 K of security funds plus Finance took

an additional \$85 K of general funds. In January 2004, another \$200 K of general and \$100K of security funds were released. The ACR Division had agreed to share the cost of several projects and transferred \$83 K to the Program, thus resulting in a final Program budget of \$1,649 K.

2 Program Performance

When looking at the financial performance of the Program (see section 2.1) one would conclude that it did very well. The careful monitoring of the Program resulted in there being no lapse of funds for the first time in many years. However, one may ask if the Program received good value for its money? According to the proponents of the completed projects, the answer is yes.

Twenty-seven of the twenty-nine Post-Project Evaluations (PPE) rated the quality of their final report as Very Good or Excellent. Twenty-five indicated that the funding level of their project was fully adequate with 90% of the projects coming in on or under budget. When asked what the outcome of their project was, for which more than one choice was permitted:

- twenty-three felt it had increased the knowledge base of staff;
- seventeen indicated that it created contacts with experts outside the CNSC;
- nine stated that the project assisted in the dissemination of knowledge/information as the results would be published in a scientific or engineering meeting abstract, proceedings or journal;
- eight indicated that it would lead to the preparation of a Regulatory Policy, Standard, Procedure, Guide or new Regulation;
- three stated that results would be used in license conditions; and
- two indicated that results would be used to resolve generic action items.

2.1 Fiscal Performance

The overall Program budget is based on the project duration and funding requested by the Proponent. It assumes that the projects will be started on time. The majority of the projects in the program are designed to be completed within one fiscal year; however, some may be multi-year projects.

Fiscal performance of the Program is dependant upon three factors:

- timeliness of project initiation;
- adherence of the projects to their intended schedule; and
- number of unexpected carryovers (UCOs)

2.1.1 Project Initiation

All projects require lead time prior to starting in order to develop the Statement of Work, advertise for bids and select the contractor. This lead time must be taken into consideration by the proponent when he or she is planning their work, for example, if the proponent wants the project to start in June, he or she needs to initiate in April. When the proponent does not initiate the project early enough, the delay can result in the project running into the next fiscal year therefore affecting the Program's budget requirements. There can be many reasons for the proponent not initiating the project early enough, for example, his/her failure to understand the complexity of starting and

the time requirements; however, regardless of the reasons, there is an impact on the Program's budget. Depending on when the project is initiated and the actual work started, the Program budget may be adjusted and funds reallocated or returned to Finance.

2.1.2 Project Schedule

As projects are initiated and their contract prepared, a milestone payment schedule is determined based on the project's deliverable schedule. Any delays in the project schedule will cause postponement of one or more payments. In some cases, delays only shift the point in the fiscal year when the payment is made; however, some delays result in payment(s) being pushed into the next fiscal year.

Project delays may or may not be avoidable. Unavoidable delays are those caused by unforeseen circumstances such as unexpected results that require the redoing of a task. Avoidable delays are those where the root cause could have been prevented such as:

- Contractor failing to adhere to schedule;
- CNSC licensee(s) failing to provide information in a timely manner; or
- CNSC proponent failing to review deliverables and/or providing information in a timely manner.

RSRD constantly monitors project schedules throughout the year. When a project schedule is delayed, the impact on the overall Program budget is determined. If the funds cannot be used elsewhere, Finance is advised on how much of the Program budget is to be released. However, when the delays occur late in the year, there is insufficient time for these funds to be redistributed and as a result the Program lapses funds.

2.1.3 Carryovers

There are two types of carryovers, planned and unexpected. A planned carryover is one in which the project is multiyear in duration or, due to its start date, will not complete until the following fiscal year. Unexpected carryovers (UCOs) are those projects where last minute changes made to the scope of work or project delays result in slipping into the next fiscal year. The number of UCOs and their funding requirement greatly affects the fiscal performance of the Program as there is no time to reallocate funds. UCOs also have an impact on funding requirements for the following year.

Figure 1 shows the timelines of the projects in the 2003-2004 Program. The figure reveals that approximately a third of the projects had been carried over from the previous year. Of the remainder, half did not start until the third or fourth quarter. Since the figure graphically represents the duration of the project once a contract has been issued or amended, it does not show the length of time it takes to initiate a project (develop work statement, RFP, etc) or the number of projects that had been amended.

2.2 FY 2003-2004 Expenditures

Actual spending exceeded the final approved budget with the final expenditure being \$1,751 K. After taking into consideration the funds recovered (\$81 K) from external third-parties

with whom we entered into agreements, the resulting over-expenditure was only \$21 K. The general breakdown of the expenditures (with values rounded to the nearest \$1 K) for the year was as follows:

a) Research and Support projects, including staff travel for project management	\$1535 K	88%
b) Security related R&S projects	\$ 78 K	4%
c) Class IV Grants and Contributions	\$ 138 K	8%

The breakdown of expenditures between in-progress, planned and new projects can be seen in Table 1. The completed projects are listed in Appendix A, along with the actual expenditures for each. Thirteen public RSP reports were released during the year, four of which were from projects which had been completed in the previous fiscal year. A complete listing of these reports is provided in Appendix B.

2.3 Comparison with Previous Years

Table 2 compares the fiscal performance of the 2003-2004 Program with previous years.

The size of any lapse is a measure of the efficiency with which the Program has been managed, since funds unspent in one year must be found from the following year's budget. The target is to achieve a lapse of less than 5%, since this is the maximum percentage of funds that the organization as a whole can carry forward to the next fiscal year, though the Program itself is not permitted to carry forward lapsed funds. The greater the proportion of the budget committed to projects carried over from the previous year, the lesser the ability of the Program to respond to proposals for new work.

The 2003-2004 Program did not lapse funds, rather it over expended. The lack of a lapse can be attributed to careful financial monitoring of the program. Funds were released as soon as they were identified as being surplus. This resulted in funds being made available for other use within the organization as early as September.

Despite the fact that the Program did not lapse funds the final expenditures were less than originally budgeted. This is due to several reasons:

- three Level 1 projects were not initiated by the proponents;
- one Level 1 project was put on hold by the proponent early in the year;
- a large new project which was requested late in the 3rd quarter was not able to get going as quickly as expected;
- delays in the contracting process for several of the projects; and
- delays in the schedule of several projects that resulted in more funds slipping into the 2004-2005 Program.

The slight over-expenditure was caused by higher costs associated with completing the review of the "Status of Canadian Research Related to the Mandate of the CNSC" (R234.1), which finished on March 31, 2004.

2.4 Program Effectiveness Review

The 2003-2004 Program addressed a high demand for research and support work, comprising sixty-eight active projects, of which thirty-one had been in-progress (including the UCOs) at the start of the year. A total of thirty-three projects were completed during the fiscal year. Three projects were cancelled at various stages prior to contract award and one project was terminated early due to changes in work requirements.

Originally twenty-one projects (over and above those already in progress) were planned in the Program (i.e., Level 1 approval). Of the Level 1 projects only eighteen were actually initiated by the project managers. Delays in the initiation or project schedule resulted in funds becoming available for additional projects. As a result, one project with Level 2 approval and twenty-one new projects were started in 2003-2004. The decision to fund these new proposals over those already approved as Level 2 in the Program was based on the urgency of the project or the greater ability to be initiated and completed.

3 Conclusion

Based on the fiscal performance and the results of the Post-Project Evaluations the 2003-2004 Research & Support Program was a success, with the funds having been spent effectively and efficiently in the view of the Research & Support Committee. This conclusion was endorsed by the Operations Management Committee.

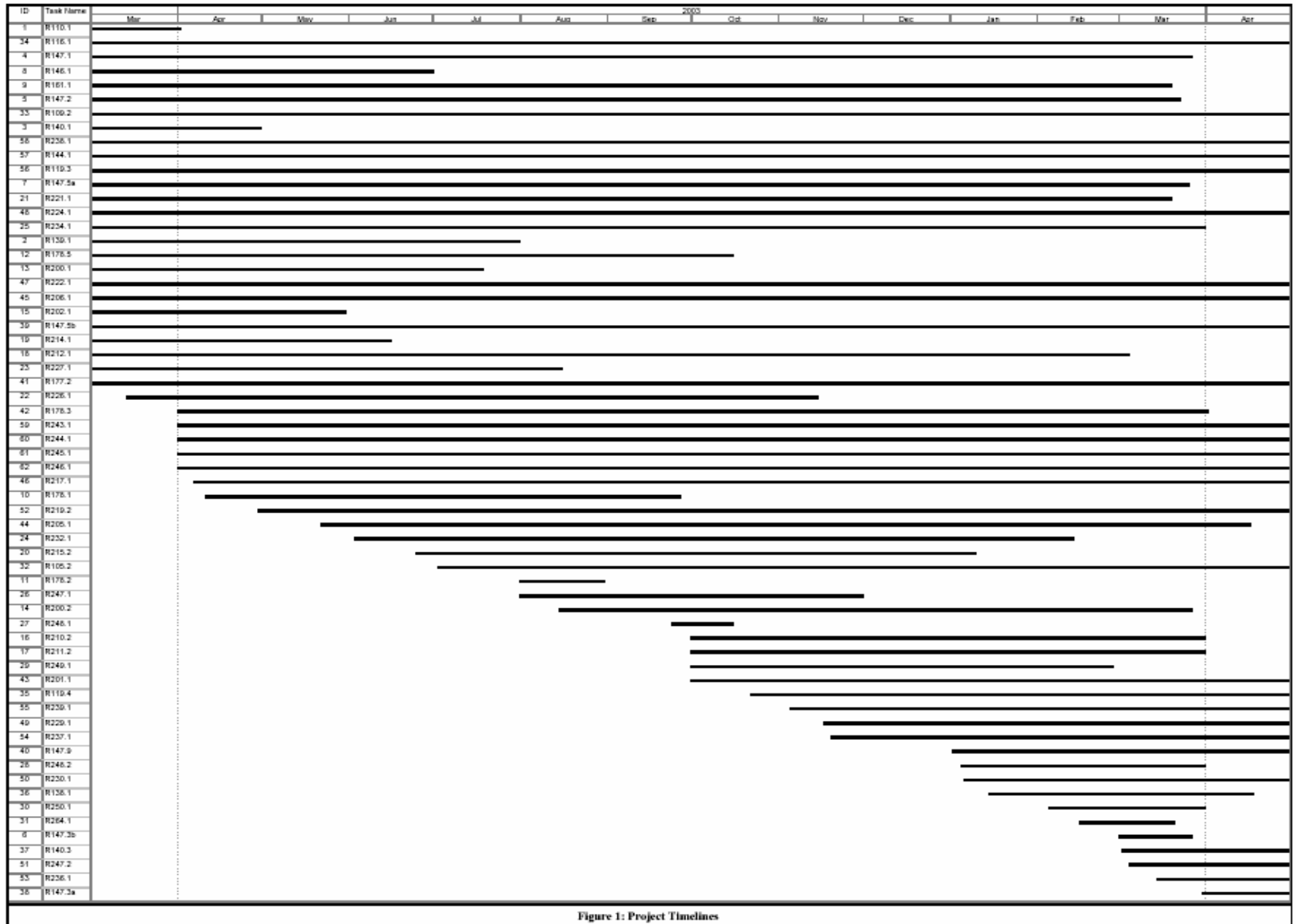


Figure 1: Project Timelines

Table 1 - Breakdown of Expenditures

Project Source	Number of Projects		Expenditure (\$K)
In-progress projects	Completed	7	193
	Cancelled	2	0
	On-going	11	341
New Projects in Program (Level 1 approved)	Completed	7	373
	Cancelled	1	0
	On-going	9	276
Projects advanced from Level 2 approval	Completed	0	
	On-going	1	11
Unplanned Carry-overs	Completed	7	90
	On-going	0	
New Projects not in Program	Completed	12	225
	Cancelled	1	0
	On-going	10	242
Cost Recovered Funds			-81
Total Expenditures		68	1,670

Table 2 - Financial Comparison with Previous Years

	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
Final Budget	2020	2320	1784	1560	1454	1649
Expenditure	1861	2146	1730	1417	1215	1670
Lapse (over-expenditure)	159	174	54	143	239	(21)
Lapse % (% over)	7.9	7.5	3.0	9.1	16	(1.3)
In-progress projects	907	1055	798	861	631	871
In-progress projects %	45	49	46	61	52	53

Appendix A: Projects Completed in Fiscal Year 2003-2004

R110.1	\$0 K ¹	Contribution - International Study on Nuclear industry Workers - CANCELLED
R139.1	\$33 K	Review of the Coverage Limit in the Canadian Nuclear Liability Act – Phase II
R140.1	\$10 K	The Effects of Ageing on Reactor Physics Parameters – Phase I
R147.1	\$4 K	Saskatchewan Uranium Miners’ Cohort Study (SUMC) – Preparation of Cohort
R147.2	\$19 K	Saskatchewan Uranium Miners’ Cohort Study
R147.3b	\$2 K	Updated Analysis of the Eldorado Uranium Miners’ Cohort – Part I of the SUMC Study
R147.5a	\$9 K	Un-duplicate the Eldorado Cohort – Part I of the SUMC Study
R146.1	\$0 K	Development of Draft Regulatory Guides for Nuclear Security Regulations - TERMINATED
R161.1	\$53 K	Uranium Concentrations in Port Hope Soils, Vegetation and Soil Organisms
R178.1	\$10 K	Technical Review Panel for the SUMC Study
R178.2	\$2 K	Ethical Review of the SUMC Study
R178.5	\$13 K	Feasibility Study for Part II of SUMC Study
R200.1	\$4 K	Validation of Fuel Computer Codes used in Safety Analysis
R200.2	\$20 K	Validation of the ELESTRES-IST 1.0 Safety Analysis Computer Code
R202.1	\$11 K	International Regulatory Practices in Fuel Design Qualification
R210.2	\$3 K	CNSC Working Group on External Dosimetry
R211.2	\$16 K	CNSC Working Group on Internal Dosimetry

¹ Values shown have been rounded to the nearest \$1 K and include Project Manager’s travel where applicable.

R212.1	\$23 K	Comprehensive Review of the Effectiveness of Waste Rock Management and Decommissioning Practices
R214.1	\$30 K	Assessment of Radiation Doses Arising from Civilian or Military Vehicle use of Radium Luminous Devices in Operation or Static Display Vehicles
R215.2	\$30 K	3rd Workshop on the Remediation of Legacy Uranium Mines in Canada
R221.1	\$8 K	Information on Technologies Available for the Reduction of Tritium Emissions
R226.1	\$32 K	Condition Assessment and Life Cycle Management of Aging Steam Generators after Lay-up State and Long Term Operation
R227.1	\$21 K	Appraisal of Industry Analysis of Scaling of Coolant Voiding during Early-blowdown Phase of LLOCA and its Applicability to CANDU Reactors
R232.1	\$152 K	Characterization of Northern Transportation Route (NTR) Sites under Institutional Control
R233.1	\$0 K	Analysis of Contact Boiling Experimental Data – CANCELLED
R234.1	\$143 K	Research Review Group – Status of Canadian Research Related to the Mandate of the CNSC
R241.1	\$4 K	Review of Source Term Model for Jeb TMF
R242.1	\$30 K	Contribution – NATC Information System of Occupational Exposure (ISOE)
R247.1	\$99 K	Safety Culture Evaluation of Point Lepreau
R248.1	\$1 K	Verification of Radiation Safety Data Sheets
R248.2	\$3 K	Verification of Radiation Safety Data Sheets - Phase 2
R249.1	\$25 K	Assessment of Maple 1 Power Coefficient Measurements
R250.0	\$0 K	Robustness of Nuclear Facilities – Background & Methodology – CANCELLED
R250.1a	\$31 K	Robustness of Nuclear Facilities – Impact Study

R251.1	\$5 K	Meeting with Periodic Safety Review Team
R264.1	\$23 K	Verification and Updating the MCNP Input Developed by the CNSC for ACR Modeling
Misc	\$12 K	Miscellaneous expenditures, travel etc from projects that had been deemed completed in FY 2002-2003

The total expenditure in FY 2003-2004 for projects which were completed during the year is \$881 K.

Appendix B: Reports Issued in Fiscal Year 2003-2004

RSP-0164, Report on Performing External Dosimetry during Non-uniform Radiation Exposures, CNSC Working Group on External Dosimetry, Canadian Nuclear Safety Commission (CNSC)

RSP-0164-1, Report on Performing Neutron Dosimetry in Canada, CNSC Working Group on External Dosimetry, Canadian Nuclear Safety Commission (CNSC)

RSP-0165, Uranium Intake - Dose Estimation Methods, CNSC Working Group on Internal Dosimetry, Canadian Nuclear Safety Commission (CNSC)

RSP-0166, Simulation of the FEBEX Experiment as a Test Case for DECOVALEX III, A.P.S. Selvadurai and G. Armand, Selvadurai and Associates Inc.

RSP-0167, Proposed Plan for Scaling Analysis, Dr. W. Wulff, Consultant

RSP-0168, Review of the Coverage Limit in the Canadian Nuclear Liability Act - Phase II, International Safety Research Inc.

RSP-0169, Review of Bruce A Steam Generator and Preheater Condition Assessment and Life Cycle Management Plan for Research Project; Condition Assessment and Life Cycle Management of Aging Steam Generators, J.A. Gorman, and C.R. Marks, Dominion Engineering Inc.

RSP-0170, Proceedings of the Long Term Management Perspective for Idle Uranium Mines Workshop, Wardrop

RSP-0171, Assessment of Radiation Doses Arising from Civilian or Military Vehicle use of Radium Luminous Devices in the Civilian Community from Operation Vehicles, Museums and Collections, Fergus Devereaux, Canadian Nuclear Safety Services Inc.

RSP-0172, International Regulatory Practices in Fuel Design Qualification, Davies Associates Inc.

RSP-0173, Characterization of Northern Transportation Route (NTR) Sites under Institutional Controls, AMEC Earth & Environmental (a division of AMEC America Limited).

RSP-0174, Comprehensive Review of the Effectiveness of Waste Rock Management and Decommissioning Practices, R.V. Nicholson, Stantec Consulting Ltd.

RSP-0175, Uranium Concentrations in Port Hope Soils and Vegetation and Toxicological Effect on Soil Organisms, EcoMatters.