Chapter 34

Other Audit Observations

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Other Audit Observations

Main Points

34.1 The *Auditor General Act* requires the Auditor General to include in his Report matters of significance that, in his opinion, should be brought to the attention of the House of Commons.

34.2 This chapter fulfils a special role in the Report. Our other chapters normally report on value-for-money audits or on audits and studies that relate to operations of the government as a whole. "Other Audit Observations" reports on specific matters that have come to our attention during our financial and compliance audits of the Public Accounts of Canada, Crown corporations and other entities, or during our value-for-money audits.

34.3 This chapter covers the following:

- Atomic Energy of Canada Limited records its decommissioning and site remediation liabilities;
- managing suspected abuse and fraud in the Employment Insurance program;
- lack of clarity on basis used in setting Employment Insurance premium rates; and
- federal investment in Big Science: the Sudbury Neutrino Observatory.

34.4 Although each audit observation reports matters of significance, they should not be used as a basis for drawing conclusions about matters not examined.

Introduction

34.5 This chapter contains matters of significance that are not included elsewhere in the Report and that we believe should be drawn to the attention of the House of Commons. The matters reported were noted during our financial and compliance audits of the Public Accounts of Canada, Crown corporations and other entities, or during our value-for-money audits.

34.6 Section 7(2) of the *Auditor General Act* requires the Auditor General to call to the attention of the House of Commons any significant cases where he has observed that:

- accounts have not been faithfully and properly maintained or public money has not been fully accounted for or paid, where so required by law, into the Consolidated Revenue Fund;
- essential records have not been maintained or the rules and procedures applied have been insufficient to safeguard and control public property, to secure an effective check on the assessment, collection and proper allocation of the revenue, and to ensure that expenditures have been made only as authorized;
- money has been expended other than for purposes for which it was appropriated by Parliament;
- money has been expended without due regard to economy or efficiency;
- satisfactory procedures have not been established to measure and report the effectiveness of programs, where such procedures could appropriately and reasonably be implemented; or
- money has been expended without due regard to the environmental effects of those expenditures in the context of sustainable development.

34.7 Each of the matters of significance reported in this chapter was examined in accordance with the legislative mandate, policies and practices of the Office. These policies and practices embrace the standards recommended by the Canadian Institute of Chartered Accountants. The matters reported should not be used as a basis for drawing conclusions about matters not examined.

This chapter contains matters of significance that are not included elsewhere in the Report.

Atomic Energy of Canada Limited

AECL records its decommissioning and site remediation liabilities

We are pleased to report that Atomic Energy of Canada Limited (AECL) has recorded its decommissioning and site remediation liabilities in its 1999–2000 financial statements. For the first time since 1992, our annual Auditor's Report gives an unqualified opinion on AECL's financial statements. In accordance with generally accepted accounting principles, the Corporation recorded a liability of $377,500,000 representing its estimate, as at 31 March 2000, of the present value of future expenditures.

Atomic Energy of Canada Limited has recorded its decommissioning and site remediation liabilities in its 1999-2000 financial statements.

Background

34.8 Atomic Energy of Canada Limited (AECL) is a parent Crown corporation that reports to Parliament through the Minister of Natural Resources. AECL develops, markets and manages the construction of power and research reactors and carries out related research. It manages nuclear waste at its laboratory sites in Chalk River, Ontario and Pinawa, Manitoba. In our 1992 annual Auditor's Report, we first brought to Parliament's attention the fact that AECL faced significant decommissioning and site remediation liabilities that were not recorded in its financial statements.

34.9 Subsequently, AECL disclosed these liabilities in the notes to its financial statements for the years ended 31 March 1993 through 31 March 1999. However, we were not able to provide an unqualified opinion on the reliability of the financial statements to the users of the statements, in particular, the Minister of Natural Resources, the government, members of Parliament, and the public.

34.10 We also reported, in both our 1993 and 1996 reports of the Auditor General, that AECL had not provided for these liabilities. The magnitude of the decommissioning and site remediation liabilities is such that they may place significant demands on government resources in the future. Generally accepted accounting principles require that the costs be recognized over the estimated lives of the corresponding facilities. This is important accountability information for Parliament. It is also important that AECL adhere to the *Financial Administration Act*, which requires parent Crown corporations to prepare annual financial statements in accordance with generally accepted accounting principles.

34.11 In addition, our 1998 to 2000 Auditor's Reports brought an "other matter" to Parliament's attention. Since 1994–95, the Governor in Council has not approved AECL's five-year corporate plans, and AECL continues to work with the government to address budget and policy issues affecting the Corporation.

34.12 The government has indicated that it expects to approve AECL's five-year corporate plan for 2001–02 to 2005–06.

Conclusion

34.13 We are pleased to report that AECL has changed its accounting policies to comply with generally accepted accounting principles and has recorded its decommissioning and site remediation liabilities in its 1999–2000 financial statements. For the first time since 1992, our annual Auditor's Report gives an unqualified opinion on AECL's financial statements.

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Canada Customs and Revenue Agency and Human Resources Development Canada

Dealing with suspected abuse and fraud in the Employment Insurance program

Human Resources Development Canada (HRDC) and the Canada Customs and Revenue Agency (CCRA) have known for many years of the abuse and suspected fraud in the Employment Insurance program in British Columbia relating to false Record of Employment forms. HRDC and the CCRA have been unsuccessful in curtailing these abuses. An action plan needs to be implemented by HRDC and the CCRA to adequately deal with suspected abuse and fraud of the Employment Insurance program.

Background

Human Resources Development Canada (HRDC) and Canada Customs and Revenue Agency (CCRA) jointly administer and enforce the *Employment Insurance Act*.

34.14 The *Employment Insurance Act* is administered and enforced jointly by the Canada Employment Insurance Commission of Human Resources Development Canada (HRDC) and the Canada Customs and Revenue Agency (CCRA), previously known as Revenue Canada. HRDC administers the entire Act except for Parts III, IV and VII, which are the sole responsibility of the CCRA. HRDC is responsible for paying out employment insurance (EI) benefits and the CCRA is responsible for insurability provisions and collecting EI premiums.

34.15 The legislative changes, enacted in 1971, were structured so that only one federal government agency would be responsible for remittance and ensuring proper withholding by employers of payroll deductions such as income tax, Canada Pension Plan (CPP) contributions and EI premiums. The CCRA is responsible for resolving any insurability employment questions through insurability rulings. This allows a uniform interpretation and application of the coverage provisions of the Canada Pension Plan and the Employment Insurance program.

34.16 In 1999–2000, HRDC requested nationally approximately 27,000 insurability rulings related to EI benefits from the CCRA; 2,000 of those requests originated from HRDC's Investigation and Control Directorate. The Directorate's mandate is to prevent, deter and detect abuse and fraud committed against the programs and services that pay income benefits administered under the *Employment Insurance Act* and its regulations.

34.17 If during an investigation, the Directorate determines that a Record of Employment form is inaccurate, questionable or false in relation to a period of employment and/or insurable earnings, it requests an insurability ruling from one of CCRA's local CPP/EI rulings units. In cases of insurability, once HRDC requests an insurability ruling, it ceases its investigation. The Department cannot deny or recover EI benefits without an insurability ruling. The Record of Employment form is an important document to the Employment Insurance program. It is prepared by employers to reflect the actual hours or weeks and earnings of an employee prior to employment termination. An employee must submit this form along with their EI application to qualify for and obtain EI benefits.

Scope

34.18 The Office of the Auditor General received a complaint alleging

extensive abuse and fraud of the Employment Insurance program by two industries in British Columbia's lower mainland. Further, the complainant alleged that these problems were occurring in other industries. The allegations stated that employers were issuing false Record of Employment forms to employees or other individuals so they could obtain EI benefits fraudulently. The complainant also alleged that HRDC and the CCRA have been aware of this fraud for over 20 years but have not taken appropriate action to stop it.

34.19 The scope of our examination was limited to how HRDC and the CCRA examined, investigated and responded to these alleged practices of abuse and fraud of the Employment Insurance program in British Columbia. We inquired into suspected false EI benefit claims relating to questionable Record of Employment forms. We interviewed HRDC staff and officials at various local British Columbia offices and at headquarters. We also interviewed CCRA staff and officials at the Vancouver Tax Service Office and at headquarters.

34.20 We reviewed HRDC investigation files involving suspected false Record of Employment forms issued by one industry in British Columbia. Our review encompassed over 250 HRDC claimant investigations relating to Record of Employment forms issued by four separate employers. We also reviewed the associated CCRA insurability rulings connected to these HRDC investigations involving over 250 CCRA insurability rulings. The period reviewed was from 1997 to 2000.

34.21 The findings in this audit are based on our review of HRDC's and CCRA's handling of suspected abuse and fraud in the Employment Insurance program in British Columbia relating to Record of Employment forms. Therefore, the findings should not be applied nationally.

Issues

34.22 HRDC officials have been aware of these alleged fraudulent practices for over 20 years. The Department advised us that they have undertaken initiatives, during the early 1980s and 1990s, to combat the abuse with mixed results. In 1997 they participated in a joint initiative with the Employment Standards Branch of British Columbia's Ministry of Labour, to deal with the alleged extensive abuse of British Columbia's Employment Standards and the Employment Insurance program by one industry in British Columbia. The initiative involved compliance investigations, educational activities for the industry and community awareness sessions.

34.23 CCRA staff and officials are aware of these suspected fraudulent practices that have been going on for many years. The CCRA informed us that in 1999, it joined the HRDC and British Columbia Ministry of Labour, Employment Standards Branch initiative and assigned some resources which included participating in joint interviews. A recent Tax Court of Canada decision will prevent the CCRA from continuing to participate in these joint interviews. The CCRA recently created a new job description called the Complex Case and Technical Review Officer and appointed one of its British Columbia rulings officers to this position. The responsibilities of this position include assisting and participating in joint efforts with HRDC in the resolution of complex cases where EI fraud is suspected.

HRDC and CCRA officials for many years have been aware of suspected fraudulent practices related to false Record of Employment forms.

34.24 We determined that there was abuse of the Employment Insurance program in British Columbia and that EI benefits were obtained through the use of false Record of Employment forms. This audit makes observations on the processes and practices used by HRDC and the CCRA to deal with the cases of suspected abuse and fraud in the Employment Insurance program in British Columbia.

Legislative guidance on rulings and appeals is silent

34.25 The *Employment Insurance Act* addresses the division of HRDC and CCRA roles in the administration of the insurability issue. However, it is unclear on how rulings are to be made and appeals are to be decided; the process is not transparent in our view. The Act allows the Minister of National Revenue to make regulations, which would regulate the procedure to be followed in making rulings or deciding appeals. To date, no regulations have been issued, but the CCRA does have internal administrative guidelines for making rulings and deciding appeals.

The *Employment Insurance Act* is unclear on how rulings are to be made and appeals are to be decided.

Lack of guidance and training

34.26 CCRA's ruling administrative guidelines are based on the premise that claimants and employers are honest. We reviewed CCRA's rulings training and policy manuals and found no information providing guidance on dealing with cases of suspected abuse or fraud.

34.27 In our opinion, rulings officers lack the guidance, training and experience necessary to handle cases of suspected abuse and fraud.

Limited review and examination

34.28 HRDC's Investigation and Control Directorate investigates EI claims where abuse and fraud is suspected. In investigations involving Record of Employment forms, HRDC's investigations include interviewing in person claimants and employers and examining business records. If sufficient evidence is obtained to question the validity of the Record of Employment forms, the Directorate ceases its investigation and requests an insurability ruling from the CCRA. In these insurability cases, the Directorate never completes an in-depth investigation as the matter is referred to the CCRA. We observed that, prior to referring the matter to the CCRA, the depth of the HRDC investigation varied from case to case.

34.29 Without an insurability ruling, HRDC cannot adjust a claimant's insurable hours, weeks or earnings even if it has evidence that the information is inaccurate or false. The one exception is if HRDC can prove that the claimant performed no work, making the Record of Employment totally false. However, the claimant or employer can still request an insurability ruling. In these cases, HRDC did not prove that the Record of Employment forms were totally false and therefore requested insurability rulings.

34.30 For an insurability ruling, CCRA rulings officers review information and documents submitted, interview claimants and employers usually by telephone or through a questionnaire, and may request photocopies of documents. We found that rulings officers seldom leave their offices to visit business premises, examine original business records or meet claimants or employers. Further, in interviews where there was a language barrier, CCRA rulings officers almost always used the claimants' family and friends as translators.

34.31 We were informed that rulings officers are not trained as auditors or investigators. Nor do they use the expertise of investigators or forensic accounting specialists, who are available through CCRA's special investigation units. In CCRA rulings that we reviewed, investigators or other specialists were not used.

34.32 CCRA's budgeted time standard to complete an insurability ruling is four and a half hours. CCRA officials told us that they use the time standard only as a guideline to allocate resources. Rulings officers advised us that they take between three to eight hours to complete a ruling that HRDC's Investigation and Control Directorate requests. Our review of over 250 CCRA insurability rulings on claimants relating to four employers,

determined that rulings officers averaged five and a half hours to complete each ruling where abuse and fraud was suspected. In our opinion, this is insufficient time to adequately review, examine and reach a determination in cases where abuse and fraud is suspected. We strongly recommend that the CCRA re-examine the resources required to adequately deal with EI claims where abuse or fraud is suspected.

Evidence assessed differently

34.33 HRDC submits, to the CCRA rulings officer, information obtained during its investigation including interview notes with claimants and employers, copies of documents, and any working papers and reports.

34.34 CCRA rulings officers advised us that they must verify all facts provided by HRDC. They do this by interviewing claimants and employers and by asking similar questions to those asked by HRDC. If oral statements from claimants differ from those initially given to HRDC, and the rulings officers cannot resolve the contradiction, they will accept the new statement without any additional supporting evidence. Rulings officers advised us that the claimant and employer statements differed frequently from those initially given to HRDC. While rulings officers consider and weigh the evidence provided by HRDC, they almost always give greater weight to evidence they have personally obtained. In our opinion, this practice could lead to the credibility of evidence not being assessed adequately.

34.35 HRDC is not given the opportunity to make full representation, as it is not informed of any new oral or documentary evidence submitted. For example, rulings officers give claimants and employers the opportunity to rebut any statement they initially provided to HRDC and any other evidence submitted by HRDC. However, HRDC is not given the opportunity to comment or rebut any new statements or documents provided by claimants or employers to the CCRA. Rulings officers are not required to provide the reasons for their ruling decisions to HRDC investigators, claimants or employers and they rarely do.

Insufficient evidence to substantiate ruling

34.36 Our review of CCRA insurability rulings files determined that there was insufficient evidence, in many of the files, to substantiate the ruling decisions. Further, we determined that in many files the evidence contradicted the ruling.

We determined that in many files the evidence contradicted the CCRA ruling.

34.37 We also determined, from reviewing insurability appeals files, that many files had insufficient evidence to support the appeals decisions. We only reviewed the appeals decisions on claimants from one of the employers as the other cases were still unresolved in appeals at the time of our review.

Appeals Process

34.38 Claimants, employers or HRDC can appeal a ruling decisions to CCRA's Appeals Division. This is an appeal to the Minister of National Revenue. The mandate of the appeals officer is to provide a fair and impartial review of cases. Claimants and employers frequently appeal ruling decisions to the Minister. HRDC advised us that they generally accept CCRA ruling decisions and they rarely appeal.

34.39 The appeals process starts the re–examination of all evidence included in the rulings file. The evidence is reviewed and verified, and the claimants and employers are interviewed by telephone or through a questionnaire. This is the third time that claimants and employers are interviewed and asked similar questions. Appeals officers do not leave their offices to visit business premises, to review original business records or to meet claimants and employers. Also, appeals policy and administrative manuals do not

Claimants and employers are interviewed and asked similar questions three times.

address cases of suspected abuse or fraud. Appeals officers lack the guidance, training and experience to deal with cases where fraudulent activities are suspected.

34.40 Appeals officers advised us that claimant and employer statements often differ from those taken by rulings officers and HRDC. Appeals officers proceed on the evidence that they have personally obtained or verified. They place less weight on the evidence obtained by rulings officers or HRDC investigators, as they consider it hearsay. Appeals officers do not give HRDC the opportunity to make further representation to rebut new statements and evidence. Without the knowledge of the additional evidence submitted, HRDC is not in any position to make representation as permitted by section 93 of the *Employment Insurance Act*. Section 93 allows parties an opportunity to make representation to protect their interests.

There were substantial delays in processing and completing suspected abusive and fraudulent employment insurance claims.

34.41 Claimants, employers or HRDC can appeal the appeals decision to the Tax Court of Canada. Claimants and employers frequently appeal to the Tax Court. HRDC reports that they accept CCRA appeals decisions and they never appeal to the Tax Court.

34.42 Once an appeal is made to the Tax Court, the CCRA assigns a designated appeals officer to review the file and determine whether the CCRA should defend its position in the Tax Court. The designated appeals officer makes his decision without further representation from HRDC. In our opinion, it would be reasonable to expect that HRDC, as an interested party, be informed of any representations made and be given the opportunity to respond, prior to the decision of the designated appeals officer.

Delays in the process

34.43 There were substantial delays in processing and completing suspected abusive and fraudulent EI claims through HRDC and the CCRA. The majority of the files that we reviewed were at various stages in the appeals process after many months or years. Delays in the process could allow claimants to continue obtaining EI benefits for which they may not be entitled, or delay benefits unduly where a person is eligible, or postpone the recovery of EI overpayments. The CCRA has informed us that HRDC has started informing them of projected work relating to large fraud investigations. This will allow the CCRA to efficiently deal with the workload.

Prosecutions

34.44 The CCRA has never prosecuted employers or claimants under the offence subsection 106(4) of the *Employment Insurance Act*. This subsection encompasses the making, participating, assenting to, or acquiescing in the making of false or deceptive statements in a return, certificate, statement or answer filed or made as required. Further, HRDC has not prosecuted any employers under its offence sections in British Columbia in the last three years, but it has levied some administrative penalties.

Conclusion

34.45 The findings in this audit are based on our review of HRDC's and CCRA's handling of suspected abuse and fraud in the Employment Insurance program in British Columbia relating to Record of Employment forms. Therefore, the findings should not be applied nationally.

34.46 CCRA's rulings and appeals officers' lack of guidance, training, experience and expertise, combined with

the existing limited review and examination and the methods used to assess evidence, are not conducive to obtaining accurate and complete facts, in order to reach supportable conclusions when abuse or fraud are suspected.

34.47 It would be reasonable that all affected parties in the insurability ruling process be given the opportunity to make a full and proper representation during the rulings and appeals process. To this end, they need to be fully informed by the CCRA of all evidence and representations made. This would allow them to make an informed decision on any representation they may wish to make to protect their interests.

34.48 The *Employment Insurance Act* is not clear on how insurability rulings are to be made and how appeals are to be decided. To date no regulations have been made by the Minister of National Revenue in this area and guidance to the parties is limited. Therefore in our view, the process is not transparent.

34.49 Based on the findings of this audit (see paragraph 34.45), HRDC and the CCRA need to implement an action plan that adequately deals with suspected abuse and fraud in the Employment Insurance program. They need to ensure that a concerted effort is applied to detection, prevention and deterrence of cases of suspected abuse and fraud.

Canada Customs and Revenue Agency's response: *We recognize the opportunity to improve our ability to deal with complex cases involving a suspicion of fraud. We have already created the position of Complex Case and Technical Review Officer to deal with complex cases where Employment Insurance (EI) fraud is suspected and have improved communications with HRDC on their work plans for fraud investigations. We communicate with HRDC on a regular basis on ways of improving our handling of this small but challenging portion of our rulings workload. Opportunities for improving rulings officers' expertise in handling cases involving EI fraud are also being pursued through a workshop on dealing with suspected EI fraud. In addition, rulings officers with the necessary third language capability are now being assigned to cases involving language barriers.*

The objective of the EI Rulings Program is to facilitate and encourage voluntary compliance in the determination of employment status and insurable employment and earnings by providing clients with reliable EI rulings. Rulings officers carefully research, analyze and weigh the evidence and facts of each particular case in order to make a just and equitable decision on insurability. The role of appeals officers is to provide a fair and impartial administrative review of appeals on insurability issues. Neither the rulings officer nor the appeals officer is performing an investigation or enforcement function in suspected cases of abuse.

As stated in the audit note, once HRDC requests an insurability ruling from the CCRA, it normally ceases its investigation of the EI claim in question and provides all available information to the CCRA. The CCRA then carries out whatever review and information gathering is necessary to complete the insurability ruling. In the case of an appeal of an insurability ruling, any documentation that has been gathered by HRDC and Rulings is included in the rulings file, which is forwarded to Appeals.

It is important for rulings officers and appeals officers to maintain their independence and impartiality in making their decisions. Therefore, great care must be exercised in involving HRDC in the process of issuing a ruling or deciding an appeal. The separate and independent roles of the CCRA and HRDC are set out in the Employment Insurance Act. *The need to retain this independence was*

recently reinforced in the Sharbells Fish Mart decision of the Tax Court of Canada. The provisions of the Employment Insurance Act *and the recent Tax Court of Canada decision underline the need to guard against involving HRDC in the determination of insurability in a manner that may taint the process.*

The Employment Insurance Act *sets out both the rulings and appeals processes. Subsection 90(1) of the* Employment Insurance Act *states the areas where the Minister of National Revenue can rule and subsection 90(2) sets out the time frames. The administrative procedures and time frames required to appeal a ruling to the Minister of National Revenue and to appeal a ministerial decision to the Tax Court of Canada are set out in sections 91 to 94 and sections 103 to 105 of the* Employment Insurance Act.

The Office of the Auditor General is concerned that the Employment Insurance Act *is unclear on how rulings are to be made and appeals are to be decided and that these processes are, therefore, not transparent. To ensure that both workers and payors are fully aware of the elements involved in determining insurability issues, the CCRA has published guides and brochures, which are available both in paper copy and on the Internet. Information on the appeals process is provided to the public in a plain language pamphlet entitled, "Your Appeal Rights: Employment Insurance and Canada Pension Plan Coverage."*

We have also taken steps to gauge how effective these materials are in achieving transparency. A 1998 survey of Canada Pension Plan/Employment Insurance (CPP/EI) appellants indicated that most (80 percent) felt they had enough information to file an appeal and were generally satisfied with the explanation of the CPP/EI appeal process.

Government regulatory policy requires that a problem of risk exists sufficient to justify federal intervention. We feel that between the provisions of the Employment Insurance Act *and the information provided in CCRA publications, the workings of the rulings and appeals processes are explained in a clear and transparent manner. Therefore we believe that the development of regulations is not justified.*

Human Resources Development Canada's response: *The Department shares the Office of the Auditor General's concern and continues to take action including interaction with the CCRA at local, regional and national levels to address potential fraud and abuse within the particular industries in lower mainland British Columbia.*

A recent Tax Court of Canada decision and the subsequent Department of Justice legal opinion no longer permit us to do joint interviews with the CCRA in order to maintain the independence of both departments in this process. However, HRDC and the CCRA are committed to improving existing methods and implementing initiatives to deal adequately with this particular industry and are collaborating to that end.

HRDC has completed a number of recent meetings and a workshop with the CCRA to discuss the issues pertaining to insurability rulings, large investigations and improving the working relationship between HRDC and the CCRA. The CCRA has created the position of Complex Case and Technical Review Officer. The Officer is trained in investigative activity and will be more able to deal with matters concerning major employment insurance investigation cases. Joint training exercises between HRDC investigators and the new CCRA Complex Case and Technical Review Officer are being planned. This will further facilitate improvements in the way the two groups work together. We have agreed to promote

secondments between the two groups to ensure that personnel are familiar with both organizations and improve the interactive working relationships.

These initiatives are already included in HRDC's Action Plan and others will be added to ensure that suspected abuse and fraud are properly dealt with.

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Human Resources Development Canada and the Canada Employment Insurance Commission

Lack of clarity on basis used in setting Employment Insurance premium rates

The Canada Employment Insurance Commission has not explained how it sets premium rates under the Employment Insurance Act. *These rates have resulted in the rise of the Employment Insurance Account's accumulated surplus. Although it is notional in nature, the accumulated surplus balance has increased by $7.2 billion for the year to $28.2 billion at 31 March 2000. This is almost twice the maximum amount considered sufficient by the Chief Actuary of Human Resources Development Canada as a reserve for the Account. An appropriate explanation is necessary to clarify, for Parliament and the public, how the Commission exercised its discretion in setting premium rates under the* Employment Insurance Act *and to ensure that the intent of the Act is observed.*

Background

34.50 The *Employment Insurance Act* requires the Canada Employment Insurance Commission to set Employment Insurance (EI) premium rates at a level that it considers will, to the extent possible, ensure enough revenue to pay Employment Insurance program costs while maintaining relatively stable rates over a business cycle. The rate must be approved by the Governor in Council at the recommendation of the ministers of Human Resources Development and of Finance.

34.51 In his 2000 report, the Chief Actuary of Human Resources Development Canada has estimated that a reserve of $10 billion to $15 billion (attained just before an economic downturn) should be sufficient to guarantee the stability of EI premium rates over a business cycle. In the meantime, the Employment Insurance Account's accumulated surplus has grown to $28.2 billion, almost twice the maximum amount considered sufficient by the Chief Actuary.

34.52 The report of the Auditor General on the financial statements of the Employment Insurance Account for the years ended 31 March 1999 and 31 March 2000 as well as the Auditor General's November 1999 Report to Parliament drew attention to the size of the accumulated surplus, its rate of growth and the lack of disclosure of factors that were considered in determining an appropriate level of reserve. The Account's accumulated surplus amounted to $28.2 billion at 31 March 2000.

Issues

34.53 The Employment Insurance Account records the revenues and expenses of the EI program. Amounts received under the Act are deposited to the government's Consolidated Revenue Fund; EI program costs are paid out of that Fund. The EI Account is part of the Consolidated Revenue Fund and any accumulated surplus or deficit is notional in nature. Since 1986, the Account has been consolidated in the Summary Financial Statements of Canada to conform with the accounting standards of the Canadian Institute of Chartered Accountants (CICA).

34.54 The balance of the Account's accumulated surplus or deficit should serve as an important factor in setting EI premium rates, because it helps determine the level of premiums necessary to provide stable rate levels over time. Yet, the 1999 premium rates were set at a level higher than that estimated as necessary by the Chief Actuary, contributing to a continued rise in the level of reserve.

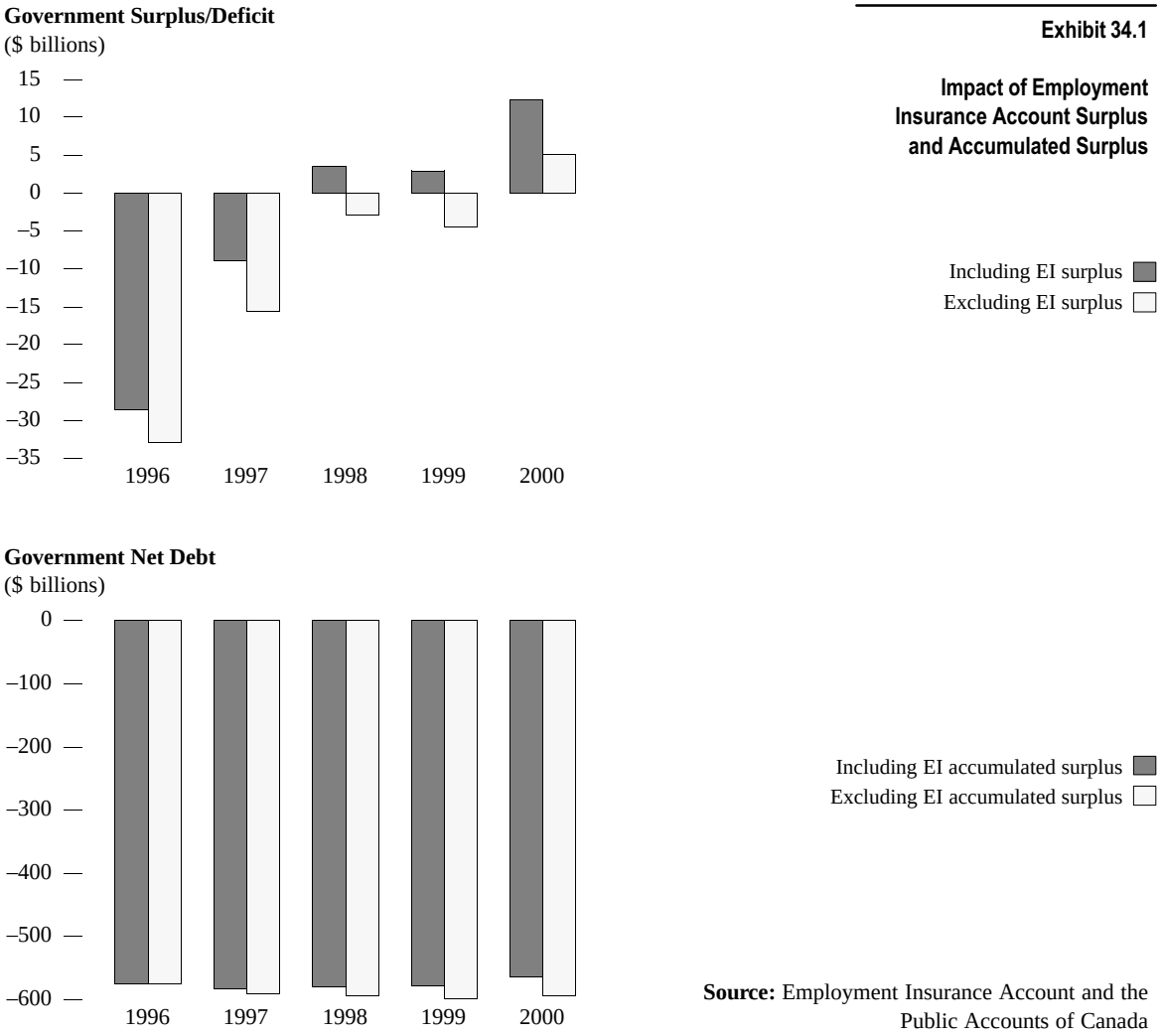
34.55 Moreover, the EI Account's operating surplus has a direct impact on the government's annual surplus. The Account's operating surplus, in effect, provides a source of revenue and cash flow for the government and helps reduce its net debt. Without the EI Account surplus and accumulated surplus at 31 March 2000, the government's annual surplus would have been $7.2 billion lower and its net debt $28.2 billion higher. Exhibit 34.1 shows the impact of the EI Account surplus and accumulated surplus on the government's surplus or deficit and net debt since 1996.

34.56 The 2000 EI premium rate for employees was set at $2.40 per $100 of insurable earnings; the employer rate was set at $3.36. The Chief Actuary estimated that employee premium rates set between $1.70 and $2.20 would meet the long-term costs of the Employment Insurance

The Employment Insurance Account's operating surplus, in effect, provides a source of revenue and cash flow for the government and helps reduce its net debt.

Exhibit 34.1

Impact of Employment Insurance Account Surplus and Accumulated Surplus



Source: Employment Insurance Account and the Public Accounts of Canada

program. In its planning documents, Human Resources Development Canada forecast that the accumulated surplus would reach $34.6 billion by 31 March 2001. As at 31 August 2000, the unaudited balance of the Account's accumulated surplus was $32.4 billion, a five-month increase of $4.2 billion.

34.57 The Standing Committee on Public Accounts recommended in February 2000 that the government disclose to Parliament the factors used to set EI premium rates and to determine the appropriate level of reserve for the EI Account. In July 2000, the government responded that it would examine a Standing Committee on Finance recommendation that set out an approach to set EI premium rates. On 28 September 2000, the government introduced Bill C–44 that set the 2001 EI premium rate for employees at $2.25. The Bill provides an interim measure for setting EI premium rates while the government reviews the rate-setting process. The review is expected to be completed by 2003.

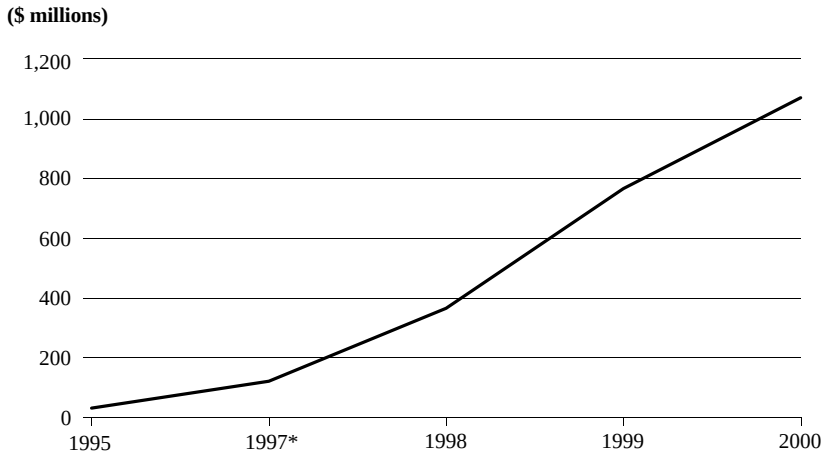
34.58 The government and the Canada Employment Insurance Commission need to provide Parliament and the public with a better understanding of how Employment Insurance premium rates under the *Employment Insurance Act* are set. This would also help ensure that the intent of the Act for setting EI premium rates is being observed.

34.59 Interest is calculated on the balance of the Account and the amount of such interest revenue in recent years has been significant. For example, interest revenue for 1999–2000 totalled $1.1 billion or approximately 15 percent of the Account's operating surplus. As at 31 March 2000, interest revenue accounted for $2.4 billion of the $28.2 billion in accumulated surplus of the EI Account. Exhibit 34.2 shows the growth of interest revenue over the past five years. Since it increases the Account's accumulated surplus, interest revenue is another factor that impacts the setting of EI premium rates.

34.60 Due to the size of the Account's accumulated surplus, a change in interest rate can have a significant impact on the Account's interest revenue. The Act provides for the payment of interest of the balance in the EI Account but does not prescribe a method to establish the interest rate. The interest rate for the Account is calculated monthly at 90 percent of the previous month's average three-month Treasury bill rate.

Exhibit 34.2

Interest Revenue Growth for the Employment Insurance Account



Source: Employment Insurance Account

* For a 15-month period

34.61 The method of calculating EI interest rate has not changed since its inception in 1970. Since then, there have been major revisions to the Act, including the most recent reform in 1996. In view of its impact on the Account's surplus, the present method of calculating EI interest rate needs to be reviewed to ensure that it remains appropriate. In addition, the government needs to explain to Parliament and the public the reasons for choosing its method of calculation.

Conclusion

34.62 The Employment Insurance program is one of the government's largest and most visible programs. It is important that the government and the Canada Employment Insurance Commission clarify and disclose the way the *Employment Insurance Act* is interpreted with regard to setting premium rates. The government also needs to disclose how it establishes the Employment Insurance Account's interest rate.

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Federal Investment in Big Science Projects

The Sudbury Neutrino Observatory

Scientific projects that rely on large, expensive facilities, or on large groups of people working toward a common goal are often called Big Science. The federal government has been involved in Big Science projects and will likely continue to fund them in Canada and abroad.

This audit looked at the decision-making and reporting processes used by federal entities in a particular Big Science project — the Sudbury Neutrino Observatory (SNO). The observatory is used to detect interactions between solar neutrinos and matter. It was built inside a 10-storey cavity located two kilometres below ground in an operating mine near Sudbury, Ontario.

We found that when funding approval was sought, Cabinet was not fully informed of the likely cost of the SNO to the federal government.

We identified some lessons learned for improving decision making in the federal government for Big Science projects:

- *ensure that complete and accurate information is presented so that government can properly assess the costs and benefits of projects;*
- *establish an inter-departmental framework for handling projects; and*
- *improve accountability for federal investments in projects.*

Background

Previous science and technology audits

34.63 This audit is the latest in a series of reports by our Office on the federal government's science and technology activities. These reports have promoted a mission-driven, results-based approach to federal spending on science and technology.

34.64 In 1994, we audited the science and technology activities of several departments and agencies and identified a number of concerns relating to management of research. At a government-wide level we identified the need for clear priorities, direction and performance expectations; effective co-ordination and oversight; leadership that transcends departmental mandates; and better information for Parliament and the public on science and technology activities and performance. At a department-wide level, we identified, among other things, the need for goals that focus more on results, and better project selection, review and management practices.

34.65 In 1996, partly in response to our audits, the federal government released its Science and Technology for the New Century: A Federal Strategy (S&T Strategy). In 1998, we reviewed the government's progress in implementing the S&T Strategy. We reported that the establishment of elements required to improve the management of federal science and technology activities was not proceeding as intended. We identified three areas requiring special attention:

- planning, setting priorities and performance reporting for results-based research;
- use of external peer review to ensure scientific excellence; and

- development of partnership strategies inside and outside government.

34.66 In November 1999, we identified a framework of attributes that can be used to assess how well research organizations are managed. With guidance from the S&T Strategy and other sources, we created a set of ideal outcomes for research management. The attributes emphasize the importance of managing research for results.

What is Big Science?

34.67 Scientific projects that rely on large facilities, or on large groups of people working toward a common goal, are often called Big Science. Big Science projects usually involve international partnerships due to their high costs.

34.68 Canada's involvement in Big Science projects that require large facilities is mainly in two fields: astronomy and physics. Exhibit 34.3 shows some past and current Big Science projects with which the federal government has been involved.

34.69 Big Science projects continue to seek funding. The most recent project is the Canadian Light Source, which produces an extremely bright light that studies matter at the atomic scale somewhat like a giant microscope. The interaction between various wavelengths

Scientific projects that rely on large facilities, or on large groups of people working toward a common goal, are often called Big Science.

Exhibit 34.3

Some Past and Current Big Science Projects Requiring Large Facilities With Which the Federal Government Has Been Involved

Field	Projects and Location	Description	Status
Astronomy and Solar System Exploration	Canada–France–Hawaii Optical Telescope (Hawaii)	A 3.6-metre telescope that explores the universe.	In operation since 1978.
	Gemini Twin Optical Telescopes (Hawaii, Chile)	An optical-infrared astronomical facility with two eight-metre telescopes that explore the universe.	Construction to be completed in 2000–01.
	James Clerk Maxwell Radio Telescope (Hawaii)	A radio telescope, 15 meters in diameter that searches and analyses naturally-emitted microwaves in the universe.	In operation since 1987.
Fusion	Tokamak (Varennes, Quebec)	A fusion reactor that researches fusion technology for the generation of electricity.	Closed in 1998 for lack of operation funding.
Fission	National Research Universal (NRU) Reactor, Atomic Energy of Canada Limited (Chalk River, Ontario)	A high-flux reactor that researches fuels and materials for the CANDU reactor, and basic materials using neutrons.	In operation until 2005.
Materials Research	Canadian Light Source (Saskatoon, Saskatchewan)	A giant high-precision microscope, producing an extremely bright light, that studies matter at the atomic scale.	Funding granted in 1999.
Subatomic Physics	Tri-University Meson Facility (TRIUMF) – (Vancouver, British Columbia)	A cyclotron that studies the structure of matter by accelerating ions up to 75 percent of the speed of light. It detects sub-atomic particles and measures their fundamental properties.	In operation since 1974.
	Sudbury Neutrino Observatory (SNO) – (Sudbury, Ontario)	For a description, see paragraphs 34.85 to 34.89.	In operation since 1998.

Source: Compiled by the Office of the Auditor General

of light and atoms in all types of matter will be used to study the structure of complex molecules, as well as track the presence and chemistry of particular atoms. The Canadian Light Source is being built in Saskatoon, Saskatchewan. Its capital costs are currently estimated at $173 million. Exhibit 34.4 shows the planned funding sources for the Canadian Light Source.

34.70 Two other Big Science projects seeking funding are the Canadian Neutron Facility for Materials Research and Iter, an international fusion energy research and development centre.

34.71 The Canadian Neutron Facility for Materials Research is a joint proposal of Atomic Energy of Canada Limited and National Research Council Canada. The facility would house a nuclear reactor that generates beams of neutrons to help understand the properties of advanced materials, such as polymers, metals, ceramics, high-temperature superconductors and biological materials. The cost of the reactor and program facilities is currently estimated at $388 million.

34.72 Iter, a collaboration among several countries, is seeking to build a facility that researches fusion energy. Iter Canada, a not-for-profit consortium of private sector, labour and government organizations, was created to supply Canadian expertise to the international design effort. It is also promoting Canada's bid to host the Iter facility. An international competition will select a host country in 2001–02. It is estimated that building costs will be between $6 billion and $10 billion over 8 to 10 years and operating costs will be $6 billion over 20 years. The Canadian contribution to the construction costs is currently estimated at $1.5 billion in cash and in kind.

Exhibit 34.4

Planned Funding Sources – Canadian Light Source

Funding Source	Amount ($ millions)
Canada Foundation for Innovation	56.4
Federal departments (including Western Economic Diversification Canada, National Research Council Canada, Natural Resources Canada)	28.3
Other (including the Government of Saskatchewan, Canadian universities, the City of Saskatoon, SaskPower Corp.)	56.2
In-kind contributions	32.6
Total	**173.5**

Attempts to manage federal involvement in Big Science

34.73 There have been discussions on how to manage federal support for Big Science for many years. Except for a brief period in 1990–91 when the Interdepartmental Committee for Big Science existed, the government has not had a structure to manage the approval, implementation and reporting of Big Science projects involving several departments and agencies.

34.74 In 1989, under the auspices of the National Advisory Board on Science and Technology, the committee on Big Science noted that if Canada was to continue its technological development among industrialized nations, it needed to invest in Big Science. The question was not whether the federal government should invest in Big Science, but rather how much it should invest and in what areas.

34.75 The committee concluded that because Big Science projects are expensive, Canada must choose its investments carefully. It was also concerned about Canada's ability to make appropriate investments in Big Science.

> A common characteristic of Big Science projects is that they are too large to be handled within the budgets of our established scientific funding agencies, i.e., federal departments, institutes and granting councils. Thus,

> these bodies cannot approve the programs and this has led to the situation where Big Science projects do not have a forum to arbitrate priorities and make the decision on whether or not they will go ahead.

34.76 The committee added that the financial commitments required for Big Science projects and the follow-on funding for operational costs make it an urgent issue for government to resolve.

34.77 The committee made a series of recommendations on handling Big Science proposals in Canada. It noted:

> ...the problem is not just a matter of selecting between proposals, it is also an issue of providing leadership — leadership to stimulate and shape proposals that, when implemented, will be key steps toward realizing our vision of Canada.

The committee recommended that:

> …an organization must be charged with the task of formulating Canada's scientific priorities and providing leadership by setting the framework for selection of all major federally funded science and technology initiatives...currently...the various line departments can commit expenditures to major projects that, while individually deserving, may be of lower priority than the needs of Canada in other areas. These decisions must be made in the context of Canada's total needs and opportunities.

34.78 Subsequently, in 1990, the Interdepartmental Committee for Big Science was created to provide a forum to review Big Science projects, establish the policy context and priorities, and provide for funding and participation recommendations to Ministers for subsequent consideration by Cabinet. After a little more than a year, the Committee stopped meeting.

34.79 In its 1996 S&T Strategy, the federal government recognized the need for new institutions and mechanisms to improve the management of its science and technology investments. The S&T Strategy conveyed the government's intention to:

- improve the co-ordination of its science and technology activities among federal departments and agencies;
- increase collaboration on major crosscutting issues; and
- put in place a systematic, government-wide co-ordination mechanism so that all players are represented.

The measures were intended to create synergies and efficiencies in the government's overall science and technology effort.

34.80 In 1998, the government created the Council of Science and Technology Advisors. It is chaired by the Secretary of State for Science, Research and Development and comprises representatives from the advisory committees of federal science-based departments and agencies. The Council, when asked by the government, examines and advises on science and technology issues that meet one or more of the following criteria:

- require government-wide strategic attention;
- offer opportunities for interdepartmental co-operation and multidisciplinary collaboration; and
- are important to a number of federal departments and agencies (for example, polar science, enabling technologies and Big Science).

34.81 To date, the Council of Science and Technology Advisors has not examined the issue of Big Science. However, it has studied science advice and the role of government in the performance of science and technology.

34.82 In 1997, the government established the Canada Foundation for

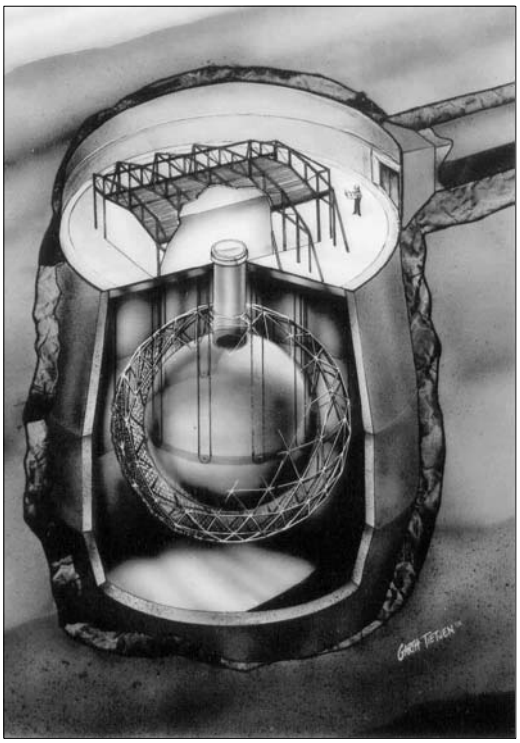
There have been discussions on how to manage federal support for Big Science for many years.

The Sudbury Neutrino Observatory is located two kilometres below ground in Inco's operating mine — the Creighton Mine, near Sudbury, Ontario.

Innovation. It is an independent corporation that provides grants to increase the capability of carrying on high-quality research in Canada. The government has since transferred $1.9 billion to the Foundation. The Foundation's funding of the Canadian Light Source shows that it can participate in Big Science projects (Exhibit 34.4). This further adds to the complexity of managing federal involvement in Big Science.

Scope

34.83 As part of this audit, we reviewed the government's involvement in the Sudbury Neutrino Observatory (SNO) to determine if there were any lessons to be learned for improving federal decision making for Big Science projects. Our audit objective was to determine if the departments and agencies involved with the project had properly disclosed to Cabinet and Parliament the full costs and likely benefits of the SNO.



The Sudbury Neutrino Observatory is located two kilometres below ground, in Inco's Creighton Mine near Sudbury, Ontario. The detector contains 1,000 tonnes of heavy water in an acrylic vessel. It is designed to detect neutrinos produced by fusion reactions in the sun (see paragraphs 34.85 to 34.89).

34.84 We did not look beyond the decision-making and reporting processes used by federal entities. For example, we did not audit the construction and operation of the facility or the quality of the science carried out at the SNO. Nevertheless, we noted that various international and national scientific bodies have endorsed the project.

Issues

The Sudbury Neutrino Observatory

34.85 The Sudbury Neutrino Observatory (SNO) is a collaborative project in particle physics involving scientists from laboratories and universities in Canada, the United States and the United Kingdom. Canada leads the international team, and its project director is a senior physicist at Queen's University. The observatory is located two kilometres below ground in Inco's operating mine — the Creighton Mine, near Sudbury, Ontario.

34.86 Fusion reactions in the sun produce vast amounts of neutrinos that interact only rarely with matter. For many years, neutrinos were assumed to be massless particles. The SNO is designed to detect the few interactions between solar neutrinos and matter and help determine if neutrinos have a mass. The SNO is in a unique position to help scientists understand the nuclear reactions that generate energy in the sun and the stars, as well as the fundamental properties of neutrinos.

34.87 The SNO was built inside a 10-storey cavity filled with water in the Creighton Mine. Suspended in the water is the heart of the detector, an acrylic sphere 12 metres in diameter containing 1,000 tonnes of heavy water and surrounded by thousands of light sensors. Neutrinos interact with heavy water molecules to produce particles and these interactions generate flashes of light that allow detailed and unique studies of solar neutrinos.

34.88 Locating the observatory inside the Creighton Mine provided natural shielding from unwanted cosmic radiation, but posed major engineering challenges. Construction began in 1990 and was to be completed in 1995. However, due to many problems, it was only completed in 1998. The first neutrinos were detected in 1999.

34.89 Other neutrino experiments exist around the world, but as they do not use heavy water, they cannot detect the different types of neutrinos. Canada has large stocks of heavy water used in the CANDU reactors. The SNO was made possible through the loan of 1,000 tonnes of heavy water (worth $300 million) from Atomic Energy of Canada Limited.

The observatory is designed to detect the few interactions between solar neutrinos and matter and help determine if neutrinos have a mass.

Information to Cabinet was incomplete

34.90 **Funding history.** Between 1986 and 1989, the Natural Sciences and Engineering Research Council of Canada (NSERC) and National Research Council Canada (NRC) provided more than $2 million to conduct preliminary feasibility studies for construction of the SNO.

34.91 In 1989, NSERC committed $16.65 million to construct the observatory. In 1990, Cabinet provided for additional funding through the NRC and Industry, Science and Technology Canada (now Industry Canada). The briefing material submitted to Cabinet stated that the total federal support for the facility would be $34.85 million, including $18.20 million in contributions from the NRC and Industry, Science and Technology Canada (See Exhibit 34.5). Total construction costs were estimated at about $48 million.

34.92 By 1993, it was clear that construction would not be completed within the original budget. Consulting and Audit Canada was asked to review the project, with a view to providing cost estimates for completion of the construction phase. It estimated that, at a minimum, $16.4 million of additional funding was needed. According to the briefing material presented to Cabinet, NSERC provided $3 million and Cabinet allocated $12.4 million for a total of $15.4 million in additional funding. In 1993–94, NSERC also provided another $1.3 million in grants.

34.93 In 1996, the project again faced a variety of difficulties that resulted in cost overruns and construction delays. In February, Cabinet approved an additional $750,000 through Industry Canada, which

Exhibit 34.5

Federal Funding for Construction of the Sudbury Neutrino Observatory

($ millions)

Year	Industry Science and Technology Canada	National Research Council Canada	Natural Sciences and Engineering Research Council of Canada	Total Federal Investment	Estimated Construction Completion Date
1989–1990	9.10	9.10	16.65	34.85	Mid–1993
1993	12.40		4.30	16.70	Mid–1995
1996	.75		0.90	1.65	December 1996
After 1996			1.10	1.10	Completed in 1998
Total	**22.25**	**9.10**	**22.95**	**54.30**	

Source: Compiled by the Office of the Auditor General and information provided by the Natural Sciences and Engineering Research Council of Canada

In the end, the total federal investment for the construction of the observatory was $54.30 million and not $34.85 million.

brought federal funding approved through Cabinet to a total of $31.35 million. NSERC awarded an additional $900,000 for construction, which brought its grant funding to $21.85 million.

34.94 In the end, the total federal investment for the construction of the observatory, including NSERC grant funding, was $54.30 million and not $34.85 million. The additional $19.44 million represents a 56 percent increase in the federal government's funding. Other contributions came from the Province of Ontario ($9.9 million), the United States ($14.1 million) and the United Kingdom ($0.7 million).

34.95 Construction cost estimates were incomplete. While decisions on federal support for Big Science are ultimately the responsibility of ministers, federal agencies play an essential role ensuring that informed choices are made. For the decision-making system to work properly, proposals and cost estimates need to be reviewed rigorously and challenged by senior managers. This would ensure that Cabinet has a clear understanding of the likely risks and results associated with Big Science projects.

We noted two important cost overrun factors — inflation and contingency allowances — that should have been better assessed and presented in the Cabinet briefing material.

34.96 We found that decision-making information provided to Cabinet for the SNO focussed mainly on the project as a unique scientific opportunity and did not provide complete cost and risk information.

34.97 In 1993, Consulting and Audit Canada noted that cost overruns were a result of:

- important changes in the project's scope and design (the changes used up a significant portion of the contingency allowance);
- inflation over the construction period;
- extra time required for excavation;
- temporary shutdowns of the Creighton Mine by Inco;
- exchange rate fluctuations;
- creation of the Goods and Services Tax; and
- unanticipated changes in the scale of participation of Atomic Energy of Canada Limited, National Research Council Canada and Inco. (The responsibility for the project was transferred to a private firm. Consulting and Audit Canada estimated that the transfer costs were $3.7 million or 19.23 percent of the cost overruns.)

34.98 We noted two important cost overrun factors — inflation and contingency allowances — that should have been better assessed and presented in the Cabinet briefing material.

34.99 Inflation. The original construction proposal provided to departments by the applicants included two cost estimates — one with inflation costs and one without. The cost estimate used in the briefing material submitted to Cabinet in 1989 excluded inflation costs. In 1993, Consulting and Audit Canada reported that inflation accounted for $4.5 million (21.63 percent) of the cost increase to that point. We found no rationale for the use of the lower cost estimate in 1989 in the Cabinet briefing material.

34.100 Contingency allowance. Big Science projects are by their very nature complex and high risk. They push the boundaries of knowledge and often rely on facilities and apparatus that have never been built before. It is crucial that, at the time of approval, all expected costs and potential risks be discussed and sufficient contingencies considered.

34.101 A contingency allowance was included in the briefing material submitted to Cabinet in 1989. However, it did not reflect some of the potential risks associated with elements of the observatory that had never been built

before (for example, the engineering challenges of the acrylic sphere). The briefing material submitted to Cabinet did not explain that construction costs could be higher than projected.

34.102 In 1993, Consulting and Audit Canada recommended that an additional $16.4 million be allocated to complete construction but noted:

> Total Canadian cost of $54.5 million, including a contingency allowance of $5.1 million, may be considered a reasonable forecast….There are still elements of risk which cannot be accurately quantified, and in a project of this complexity, *the contingency allowance may be at the bottom of the scale*.
>
> No provision has been made for "force majeure" events that could materially affect project completion and costs.

34.103 When Cabinet was asked to approve additional funding in 1993, it was not told about this limitation on Consulting and Audit Canada's recommendations. In fact, the briefing material submitted to Cabinet stated that the additional $16.4 million in funding was the maximum amount required to complete construction.

34.104 Cabinet only approved $15.4 million to complete construction. The amount was inadequate and, in 1996, a further $1.65 million was required to complete construction.

34.105 In our view, Cabinet was not provided with the necessary information to make informed decisions on funding for the observatory. As a result, when the government approved funding, it did not know how much the observatory could cost Canadian taxpayers. The problem was not in the information provided to the departments, but rather what the departments provided to Cabinet.

34.106 Operating and maintenance costs estimates were clearly presented. Once construction was completed, the SNO required funding to cover operating costs for the detector and maintenance costs for insurance fees, energy bills, etc. Most of the costs were covered by NSERC grants, which do not need government approval. We found that the operating and maintenance costs had been clearly presented to Cabinet when the project was first approved in 1989.

Total amount of federal support was not clearly presented to Cabinet

34.107 We expected that Cabinet would be fully informed about all funding sources for construction, especially federal sources, as well as the total cost to the government.

34.108 Construction costs. More than $54.30 million in federal funds was provided for the construction of the observatory. Of this amount, $31.35 million required Cabinet approval, and the remaining $22.95 million was provided by the Natural Sciences and Engineering Research Council of Canada (NSERC). The briefing material provided to Cabinet refers to only $20.55 million invested by NSERC in the SNO, although the actual amount was $21.85 million. In addition, another $1.1 million was awarded by NSERC after the final Cabinet decision in 1996.

In our view, Cabinet was not provided with the necessary information to make informed decisions on funding for the observatory.

34.109 Non-compliance with government's Policy on Transfer Payments. A 1987 Treasury Board circular on grants, contributions and other transfer payments stated that assistance to a recipient's capital project cannot be in the form of a grant. A capital project is any project intended to acquire (through construction, purchase or lease) or improve a capital asset. We found that, contrary to Treasury Board rules, the SNO received $22.95 million in grants from NSERC for construction.

34.110 The 1987 circular also stated that payment of funds should not be made earlier than required, as early pay-outs result in interest costs on the public debt.

We found that some grant payments were made earlier than required, resulting in interest costs of more than $2 million. Between 1989 and 1991, NSERC paid over $5 million toward the project, yet the money was not used until 1992–93.

Cabinet was informed about the project's potential scientific and economic benefits

34.111 The advancement of scientific knowledge is usually the prime benefit for Big Science projects. Accordingly, one would expect the economic impact to be modest and limited to regional economic benefits flowing from the construction and/or maintenance of Big Science facilities.

34.112 In our view, Cabinet was given a realistic picture of the potential scientific and economic benefits of the project. The scientific merits of the project were clearly emphasized, and the regional economic impacts were appropriately described as relatively small.

34.113 Also, the scientific complexity of Big Science projects means that decision makers should be informed about the views of national and international scientific bodies and peer-review committees on the project. In the case of the SNO, such information was provided to decision makers.

Improved reporting of project's total cost and benefits is needed for Parliament and the public

34.114 The total cost to the federal government of the SNO project has not been reported to Parliament. The Report on Plans and Priorities and the Performance Report contain each federal entity's expenditures but do not include an overview of the total federal involvement in Big Science projects.

Conclusion

34.115 The federal government will likely continue to fund Big Science projects in Canada and abroad. To improve the assessment of these projects, we believe that the government needs to consider the following issues.

A framework for handling Big Science proposals is needed

34.116 In the 1996 S&T Strategy, the government acknowledged the need to put in place a government-wide co-ordination mechanism to create synergies and efficiencies in Canada's overall science and technology effort. In 1998, it created the Council of Science and Technology Advisors to inform government on science and technology issues common to federal science-based departments and agencies. The government specifically identified Big Science as a common issue that could benefit from external advice.

34.117 The demand for funding of Big Science facilities in Canada and abroad continues to grow. Given the limited resources available for science and technology projects in Canada, such large investments must only be made with full knowledge of the overall impact on the science and technology community. The government's new science and technology management structure provides a mechanism to ensure that Big Science proposals are no longer treated on an ad hoc basis, but rather are assessed thoroughly and in the context of Canada's science and technology priorities. In our view, the Council of Science and Technology Advisors should be asked to continue the work, started by the National Advisory Board on Science and Technology, of developing a framework to handle Big Science proposals. Such a framework would ensure that decision makers have the necessary information on costs, risks, follow-on funding commitments, and impact on the community. Also, it would provide links to national science and technology

priorities as well as to activities of the Canada Foundation for Innovation and other funding sources.

Complete and accurate information is required for decision making

34.118 Big Science proposals submitted for Cabinet approval must be as complete and accurate as possible. In this regard, decision makers should be well informed about:

- The unique scientific nature of the project, which can push the boundaries of knowledge.
- The many uncertainties and risks associated with the project. These should be assessed thoroughly to see whether they are internal (technological/scientific) or external (inflation, withdrawal of partners, ''force majeure" events).
- All project-cycle costs from construction to implementation, ongoing operation and maintenance, research and development, and decommissioning.
- The financial involvement of all federal organizations and whether the funding needs government approval.
- The expected scientific benefits based on adequate analysis, including valid peer-review assessments.
- The expected economic benefits based on adequate analysis, recognizing that the potential for commercial development may be modest.
- Procedures for evaluating a project's results and benefits using measures that reflect an appropriate mix of outcomes and perspectives (for example, scientific accomplishments and economic benefits).

34.119 Furthermore, reviews should be conducted to reassess costs after key steps are completed, as follow-up to initial cost estimates. Cabinet should be informed of this process when considering initial funding.

Improved accountability for federal investments in Big Science projects

34.120 The S&T Strategy recognizes that good co-ordination of all parties is necessary to protect federal interests and attain federal objectives in collaborative projects. The S&T Strategy also recognizes the need for greater accountability in the federal science and technology effort. Effective reporting is an important component of accountability. Without good reporting, it is very difficult, if not impossible, for Parliament and Canadians to obtain very basic information.

34.121 For Big Science projects, the government should ensure that:

- A single federal authority is established for accountability purposes.
- The identified authority reports annually to Parliament on the project's status, on behalf of all the federal participants.
- Procedures are in place to manage federally funded projects that have non-federal partners, whether from the private sector, universities, foreign governments or other entities.

Big Science proposals submitted for Cabinet approval must be as complete and accurate as possible.

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