Mayo-Dawson City Transmission System Project

February 2005

Office of the Auditor General of Canada
Bureau du vérificateur général du Canada

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Auditor General of Canada
Vérificatrice générale du Canada

To the Honourable Speaker of the Yukon Legislative Assembly:

I have the honour to transmit herewith my report on the Mayo-Dawson City Transmission System Project to the Yukon Legislative Assembly in accordance with the provisions of section 35 of the *Yukon Act*.

Sheila Fraser

Sheila Fraser, FCA
Auditor General of Canada

Vancouver, 7 February 2005

Table of Contents

Mayo-Dawson City Transmission System Project

Main Points

1. The Yukon Energy Corporation recently completed the Mayo-Dawson City transmission system project to provide hydro power to Dawson City customers. The project was essentially justified on the basis of cost savings that would result from replacing diesel-generated power with hydro power. While savings may still be realized, the project was not well managed by the Corporation. This resulted in significant delays, cost overruns, and design and construction work that did not meet the Corporation's intent. In particular, the Board of Directors and management did not ensure that the Corporation established sound policies and practices or provided sufficient oversight and control over the implementation of this project. We identified

- shortcomings in defining the project scope and costs;
- substantial risks in using the chosen construction approach as the Corporation did not have the required experience and expertise;
- weak project management;
- significant deficiencies in contracting for construction and services; and
- inadequate financial management and project cost controls.

2. The Yukon Energy Corporation estimates that the total cost of the project is about $36 million, representing a cost overrun of about $7 million. However, this amount does not take into full account significant claims by the construction contractor and counterclaims by the Corporation that were still unresolved at the time of our audit.

Background and other observations

3. The Yukon Energy Corporation is the primary generator and transmitter of electrical energy in the Yukon. The Corporation serves customers living in and around Dawson City, Mayo, and Faro. It also sells power to another utility, which in turn distributes the energy to other Yukon communities, including Whitehorse.

4. In June 2000, the Corporation's Board of Directors approved the construction of a wood-pole transmission line to be completed before the end of 2002 and designed to transmit hydro power from Mayo to Dawson City, about 223 kilometres away. The scope of the project also included the construction of a new substation and modifications to two existing substations. Until this transmission system became operational in

September 2003, the Corporation supplied its customers in Dawson City (population about 2,000) with electrical energy generated from its local diesel engines. In replacing diesel with hydro power, the Corporation has almost eliminated its use of diesel generation.

5. Like any corporate body, the Corporation is expected to follow good management practices and employ sound project management principles. As a subsidiary of a government corporation, the Corporation operates at arm's length from the Yukon government. It is not subject to the same rules as government departments. However, government corporations and their subsidiaries are still a part of the government program family and subject to the same principles of corporate governance and accountability. This report provides an opportunity for the government to examine and, where necessary, strengthen the governance and accountability of government corporations and their subsidiaries.

Introduction

Yukon Energy Corporation and its operating environment

6. The Yukon Energy Corporation (YEC or the Corporation) is the primary generator and transmitter of electrical energy in the Yukon Territory, which has a population of about 30,000. The YEC is a subsidiary of Yukon Development Corporation, a government corporation owned by the Government of Yukon. The Yukon government appoints the members of the Board of Directors of the Yukon Development Corporation (who are also members of the YEC Board of Directors). The YEC Board of Directors delegates responsibility for the day-to-day business affairs to the President and Chief Executive Officer and to other senior managers. The YEC has about 66 employees.

7. Although the YEC was established in 1987 to take over electrical generation facilities previously owned by the federal government's Northern Canada Power Commission, it was not until 1997 that the YEC decided to operate and manage its own assets and hire its own staff. In its initial 10 years, the YEC contracted with the Yukon Electrical Company Limited—a private, investor-owned utility—to manage and operate all YEC facilities.

8. There are about 15,000 electricity customers in the territory. The Corporation directly serves about 1,700 of these customers—most of them living in and around Dawson City, Mayo, and Faro. Indirectly, the Corporation provides power to many other Yukon communities, including Whitehorse, through the Yukon Electrical Company Limited, which buys power from the Corporation and sells the energy to retail customers in the territory.

9. The Corporation has the capacity to generate 75 megawatts of power from its hydro facilities at Whitehorse (40 megawatts), Aishihik Lake (30 megawatts), and Mayo (5 megawatts). Its diesel generators can generate 39 megawatts. In addition, a small amount comes from wind turbines. As a public utility, its activities are governed by the territorial *Public Utilities Act*, the *Business Corporations Act*, and the *Waters Act*. The operations of the Corporation are also governed by the Yukon Development Corporation Regulation made under the *Yukon Development Corporation Act*. For example, to develop or acquire new transmission lines above a certain voltage, the Corporation is required to obtain approval from its parent corporation and the minister responsible for both the Yukon Development Corporation and the YEC.

10. Under the *Public Utilities Act*, the Yukon Utilities Board, a quasi-judicial board appointed by the Yukon government, is responsible for regulating utilities in the Yukon. The Yukon Utilities Board deals with issues that include rate changes and factors affecting rates, as well as customer service issues. For example, it may conduct a public review of general rate applications from utility companies. The review examines a utility's revenues and its costs of providing electricity, and the findings are used to establish rates. The current electricity rates were set in 1996–97, with several revisions in subsequent years.

The Mayo-Dawson City transmission system project

11. Since 1951, the Corporation's Mayo hydro facility has served customers in central Yukon. The facility originally supplied electricity to a mine and communities in Mayo, Keno City, and neighbouring areas. However, the mine was closed in 1989, leaving a surplus of about three megawatts of hydro power at the Mayo facility for a number of years. In 1991, the Yukon Electrical Company Limited assessed the feasibility of a transmission line to make use of the surplus power. In 1992, the Yukon Utilities Board held a hearing on the capital resource plan of the two companies, but recommended that no further studies on the proposed transmission line be performed unless there was a sufficient change in demand. From 1991 to 1997, electricity sales in Dawson City increased by about 29 percent. It was not until 1998 that the Board of Directors of the Yukon Development Corporation directed the YEC to undertake a full feasibility study of the proposed transmission line.

Workers mount a crossarm on a wood pole, which is used for the transmission line.

12. In June 2000, the YEC Board of Directors approved the construction of a wood-pole transmission line at a projected cost of $27,246,000 (2002 dollars). The project was to be completed before the end of 2002 and would transmit hydro from Mayo to Dawson City, a distance of about 223 kilometres. The transmission line, with a design capacity of 15 megawatts, would serve a population of approximately 2,000 and carry an initial peak electrical load of about 2.8 megawatts. In August 2000, the minister responsible for both the Yukon Development Corporation and the YEC approved the project. The scope of the project included the construction of a new substation at Callison (a subdivision of Dawson City) and modifications to two existing substations, one at Dawson City and another at Mayo. A key objective of the project was the long-term reduction of electrical rates through greater use of the existing hydro station in Mayo to replace expensive diesel generation in Dawson City.

Focus of the audit

13. We undertook this audit at the request of the YEC Board of Directors. We looked at key aspects and activities of the Mayo-Dawson City transmission system project. Our audit focussed on specific areas, including

- feasibility and cost-benefit analysis,
- overall project management,
- contracting practices,
- management of project implementation,
- financial management and project cost controls, and
- adherence to original project specifications.

While this report refers to various contractors, our comments and conclusions about management practices and actions refer only to those of the Yukon Energy Corporation. We did not audit the records of private sector contractors. Consequently, our conclusions cannot and do not pertain to any management practices that contractors followed.

For more information on our audit, see **About the Audit** at the end of the report.

Observations and Recommendations

Feasibility and cost-benefit analysis

Project scope and costs not adequately defined

14. YEC officials regard the Mayo-Dawson City transmission system as the single largest capital project the Corporation has ever undertaken. We found that the Corporation lacked the experience and expertise to carry out a project of this nature and magnitude. In total, it spent about $1.6 million on needs and feasibility analyses and preliminary engineering. While the need for the project and its feasibility and benefits were well justified, we found that the project scope and costs were not adequately defined in the feasibility study and cost estimates.

15. In May 1998, the Board of Directors of the Yukon Development Corporation authorized an amount of $400,000 to support the YEC's completion of a full feasibility study and a plan for the conceptual design, implementation, and financing of the proposed project. The YEC completed the feasibility study, which looked at different electrical options and economic conditions. The study identified an increase in demand for electricity in the Dawson City area, a decrease in interest costs, and an increase in diesel fuel prices. The study estimated that the project would cost $21 million (1998 dollars).

16. In April 1999, the Corporation hired an engineering firm to complete a peer review of the feasibility study. The review indicated that the estimated, overall project costs may have been understated by $2 million to $3 million. In April 2000, the Yukon Government's Department of Economic Development reviewed the economic assumptions and methodology used in the study and found them to be reasonable.

17. In July 1999, the YEC obtained approval from its board of directors to prepare preliminary engineering and to incur costs up to a maximum of $1.65 million, on the understanding that these expenses would become a cost of the project, should it proceed to completion. In late 1999, the Corporation selected an engineering firm to do the preliminary engineering and cost estimates.

18. In the spring of 2000, the engineering firm came up with an estimated cost of about $25.5 million (2000 dollars) for the project—$23 million for construction and $2.5 million for internal costs. On 27 June 2000, the YEC Board of Directors approved the construction of the project at $27,246,000 (2002 dollars)—$23,175,000 for construction, $1,825,000 for internal costs, and $2,246,000 for interest during construction and an inflation allowance.

19. According to the information submitted to the Board, the estimated $1,825,000 for internal costs would include a wide range of items such as

- project management,
- staff costs,
- tender preparation,

- evaluation and selection of contractors,
- costs for permits,
- financial and contract administration,
- accounting and reporting, and
- a legal survey.

The estimates appear to have been understated, given that the Corporation had already been authorized to spend up to $1.65 million to perform a feasibility study and initial design work. Nor did the estimate clearly identify as potential project costs other items such as legal and insurance costs during the construction phase.

20. A point-form project summary proposal was presented to the responsible minister in July 2000. It showed that the project was expected to save about $14 million over the life of the project (40 years) compared with the continued use of diesel. The project was also expected to generate about $4.5 million in employment opportunities for First Nations and local businesses. It would also reduce diesel emissions.

21. The YEC's analysis of cost savings showed that the present value of the costs associated with the continued use of diesel over 40 years was an estimated $42,184,000. In comparison, the Corporation estimated the present value of the costs of the transmission system over the same period at $27,964,000. Replacing diesel-generated power with hydro power would produce a net savings of about $14 million.

22. In this analysis, the YEC assumed the net capital cost for the project to be about $23 million instead of the estimated total of $27.246 million. This was done because its parent corporation (the Yukon Development Corporation) would provide $4 million in contributions. We believe that it would have been appropriate to consider the full cost in the analysis. We noted that the cost analysis did not include the capital costs needed to keep the diesel plant available as a standby operation. The YEC explained that this cost was not included in the project scope or budget because it was expected to be very modest. In the end, it amounted to about $285,000.

23. In June 2000, the YEC Board of Directors also requested the Yukon Development Corporation to provide a repayable contribution of up to $900,000 for the installation of a rural electrification infrastructure. In February 2001, the YEC Board of Directors authorized additional funding of up to $500,000 for conductor upgrades, subject to receiving a non-repayable contribution from its parent corporation. The Corporation subsequently received these contributions. With the $400,000 originally approved by the Yukon Development Corporation for a feasibility study and $27,246,000 for construction, the authorized costs associated with the project totalled $29,046,000.

24. In August 2003, the President of the Corporation at the time advised the YEC's Board of Directors that the break-even point for the project was about $40 million. However, we could not find any analysis to support this assertion. The Corporation provided us with data showing that projected over 40 years,

the estimated present value of revenues from the Dawson City area is about $44.6 million. The present value of operating costs of the transmission system projected over the same period is about $6.4 million. Our analysis suggests that the investment in this project could be justified if the capital costs did not exceed $38.2 million.

25. In summary, it appears that estimates of project costs were understated. In particular, potential internal costs were not clearly identified and budgeted for. Capital costs of keeping the diesel plant available as a standby operation were not included in the estimate. As we explain later in the report, many other changes were made to the scope of the project during the construction. It is important that the Corporation define the scope and identify the costs of capital projects adequately in seeking approval for projects.

26. **Recommendation.** To avoid underestimating total project costs, the Yukon Energy Corporation should ensure that the scope and costs of capital projects are adequately defined and identified when seeking project approval.

Management's response. The Corporation has recently improved its capital project processes. An interdepartmental Project Review Committee now reviews all capital project plans and makes recommendations to the board of directors for approval. Projects, especially larger ones, have detailed descriptions of scope and forecasted costs.

Substantial risks using the "design-build" approach

27. The proposal to the YEC Board of Directors in June 2000 suggested a single contract to construct the project using the "engineer, procure, construct, and manage" approach. The proposal also indicated that management planned to proceed with a small project management team that would include a term employee or contractor who would act as the project manager. The YEC selected this approach in the belief that it would reduce the time needed to complete the project and minimize the need for in-house staff involvement. However, it does not appear that the board of directors was fully briefed about the risks associated with using the "engineer, procure, construct, and manage" approach, later called the "design-build" approach.

28. In a June 2000 summary report, the engineering firm hired to do preliminary engineering and cost estimates identified three possible approaches to project delivery:

- design-build (turnkey);
- design, supply, and installation; and
- construction management.

29. The engineering firm cited many disadvantages and few advantages to using the design-build method for this project (Exhibit 1). For example, a disadvantage of the design-build method is that project risk is assigned to only one contractor. The engineering firm recommended that the project be delivered using the construction management approach, in which the detailed design is completed before contracts are issued, and the Corporation has direct control over the project schedule. However, despite the advice of

Exhibit 1 Key points in the engineering firm's analysis of advantages and disadvantages to using the design-build approach for the Mayo-Dawson City transmission system project

Advantages	Disadvantages
• Firm commitment to cost, time, and scope of construction • Single contract for the Corporation • Minimal need for YEC resources • No need for detailed technical input from the Corporation because the system is defined by a performance contract	• Design-build contractor not a local company • Total project scope not known (which can lead to cost overruns) • Limited opportunity to package work for small local contractors • Limited owner involvement once design-build contract is awarded • Project risk assigned to one contractor who must incorporate it in the tender price • Limited opportunity for First Nations involvement • Loss of design-build advantage because designer and constructor are not located together in the same area • Potential for conflict of interest, since designer and builder are from one company • Project bonding requirements will exclude medium-sized, but very capable contractors from participating • Large contractors could bring affiliated labourers, increasing overall cost

Source: Yukon Energy Corporation (based on a report prepared by the engineering firm hired by the Corporation)

the engineering firm, the Corporation's management recommended that the Board of Directors approve the design-build approach.

30. In this case, the YEC may have expected to benefit from the advantages of the design-build approach. However, it appears to have underestimated the associated risks as it lacked experience in using this approach. As we explain later in the report, the Corporation engaged more resources to manage the project than would normally be expected for a properly executed project.

Project not subject to a comprehensive review prior to implementation

31. Under the *Public Utilities Act*, the Commissioner in Executive Council may, by order, designate an energy project as a regulated project when the project is considered to be significant. An energy project includes any plant, smelter, refinery, or other undertaking or facility designed to use, convert, or process an energy resource. If an organization intends to construct a regulated project, it must apply to the appropriate minister for an energy project

certificate. The minister will then refer the application to the Yukon Utilities Board for a review.

32. When the minister responsible for the Yukon Development Corporation and the YEC approved the Mayo-Dawson City transmission system project in August 2000, the Yukon Development Corporation advised the minister that a transmission line did not qualify as an energy project as defined in the legislation. It also indicated that the YEC considered the risk of a problematic decision or an intervention by the Yukon Utilities Board to be low and manageable. As a result, the minister did not refer the project to the Yukon Utilities Board for review at that time. In January 2001, the Yukon Utilities Board indicated that it agreed with the YEC that there was no legal requirement for the board to approve the construction of the project or assess the prudence of any expenditure until such time as the Corporation sought to recover the costs of the project.

33. While there was no requirement for a review by the Yukon Utilities Board, such reviews are mandatory for capital projects in some other jurisdictions such as the Northwest Territories and British Columbia. They provide an independent assessment and critique of a proposed project, which can lead to improvements in the project. Such a review would have provided the Corporation with some assurance that the regulator would not raise major objections to the project after it had been completed—if it were carried out as approved.

34. In view of the significant expenditures and risks involved in major capital projects, we believe that it would be prudent for the YEC to request that the responsible minister seek an order to designate future projects of this nature and magnitude as regulated projects. This would provide for a review by the Yukon Utilities Board and, if necessary, a public hearing before the project can be implemented. The Corporation has advised us that if the projected cost of a capital project exceeds a specified threshold, it will voluntarily submit the project to the Yukon Utilities Board for review before the project proceeds.

35. **Recommendation.** The Yukon Energy Corporation should request that the responsible minister seek an order from the Commissioner of the Executive Council to designate future major capital projects as regulated projects, in accordance with the *Public Utilities Act*, so that such projects are reviewed by the Yukon Utilities Board and public hearings are held, if necessary, before the projects proceed. The minister may wish to consider proposing legislative amendments to require that all major capital projects be reviewed by the Yukon Utilities Board prior to approval.

Management's response. The Corporation is proposing to establish a process that would require projects greater than $3 million to receive prior approval by the Yukon Utilities Board.

Overall project management

Lack of established project management policy and procedures

36. We expected to find a project management policy that established consistent standards for the designation, authorization, financial control, and

conduct of capital projects. However, the Corporation does not have a project management policy, and so it lacked clear standards and procedures to implement this transmission system project. It is important that the board of directors and management establish sound policies and practices and provide oversight and control over the management and operations of the Corporation.

Roles, responsibilities, and accountability not clearly defined

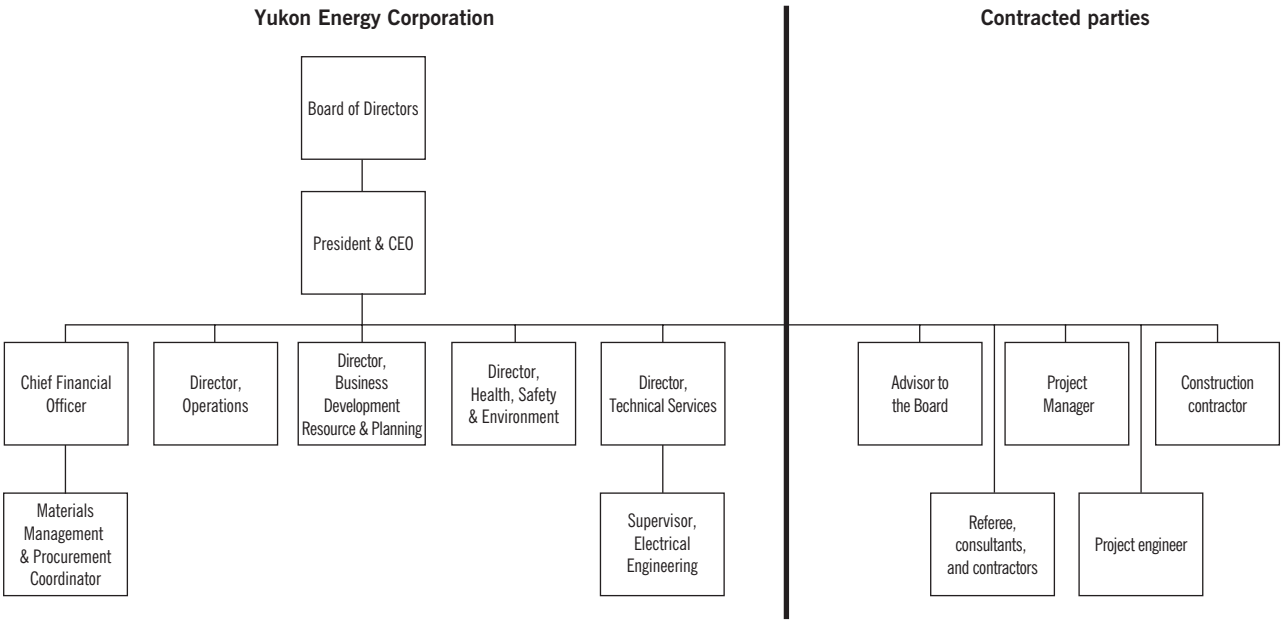
37. We expected to find a project brief with a statement of objectives that clearly defined roles, responsibilities, accountability, implementation approach, detailed budgets, and controls for this capital project. However, we did not find such a document. Instead, there were bits and pieces of information about the project management team and about lines of communication. The Corporation also referred to the responsibilities described in the construction and project manager contracts, but we found the descriptions to be inadequate.

38. We expected that there would be an initiator, a sponsor, and a project manager for a capital project. In a well-managed project, the project initiator—a manager at a senior level—is accountable for the success of the project and for ensuring that all necessary project management procedures, financial controls, and reporting requirements are in place. A project sponsor—also a manager at a senior level—is designated to support the success of the project by providing liaison with the board of directors or the senior management committee. A project manager is responsible for completing the objectives of the project.

39. It was not clear who was the initiator of the transmission system project. We found a continual change of leadership for the project between 1999 and 2004. The corporation president, who was there when the project was approved, left in September 2000. His replacement resigned in May 2001, soon after the award of the construction contract. The chief financial officer was made the next president, but he resigned in December 2003.

40. No sponsor was designated for the project. The president or the advisor to the board made progress reports to the Corporation's Board of Directors. From the beginning of the project, the Director, Technical Services (one of several key support staff to the president) was involved as a member of the project management team, which comprised several consultants and in-house staff. He prepared budgets and performed variance analysis from time to time, and he became actively involved in the project when problems arose. However, we could not find a clear description of his role. He retired in August 2003, but the Corporation retained him on contract immediately afterward to provide technical support services and to assist in resolving outstanding issues. We noted that the Corporation does not have established rules to govern post-employment contracts. The Corporation indicated that it needed to retain the services of this particular individual because his detailed knowledge of the project was critical to completing it. (Exhibit 2 shows the key players in the project.)

Exhibit 2 Key players in the Mayo-Dawson City transmission system project



41. The project manager (also referred to as the "consultant" under the construction contract called the design-build agreement) was hired on contract by the Corporation. However, it was not clear who the project manager reported to. The Corporation told us that he reported to the president during most of the project. We believe that, to successfully manage a project, a project manager must be seen to have a clear understanding of his/her role and authority. The construction contractor indicated that the project manager did not understand his role and authorities. Moreover, the project manager was not available on a full-time basis after April 2003, due to medical reasons. Although the firm acting as the project engineer provided support in the project manager's absence, the construction contractor did not view the engineering firm as the project manager.

42. **Recommendation.** The Yukon Energy Corporation should develop a project management policy to establish standards and procedures for the designation, authorization, financial control, and conduct of capital projects. In implementing capital projects, it should prepare a project brief that includes a statement of objectives and clearly defines roles, responsibilities, accountability, implementation approach, detailed budgets, and controls.

Management's response. The Corporation will undertake an audit of project management practices and procedures later in 2005. Upon completion of this review, a project management policy will be prepared. Where necessary, training will be provided to project managers. With respect to project briefs, expanded project descriptions are now prepared and reviewed by the newly implemented Project Review Committee.

Contracting practices

Lack of contracting policy and clear contracting procedures

43. The Corporation is not required to follow the general administrative policy directives issued by the Yukon Government when it contracts for construction and services. When its board of directors approved the project in 2000, the YEC only had a set of interim procurement guidelines in place. It drafted contracting guidelines in January 2002, but these guidelines had not been finalized when the project was implemented. As a result, there was no established contracting policy and no clear contracting procedures for YEC staff to follow. Specifically, we found that there were no established financial limits or thresholds above which contracts had to be awarded on a competitive basis.

44. Although the YEC did issue a request for proposals in a few cases, for this project we found that it awarded 12 contracts (each with payments over $50,000) on a sole-source basis. We found no explanation in the Corporation's files to justify this approach. The lack of a competitive process diminishes opportunities to identify the best contractor or get the best possible price for quality services. We are particularly concerned about certain contracts and payments discussed in the following sections of this report.

Significant deficiencies in contracting for construction and services

45. **Construction contract.** In October 2000, the YEC applied a set of criteria it developed to pre-qualify six firms to bid for the construction of the project. We found that the criteria were not specifically tailored to the requirements of a design-build project. Furthermore, we could not determine whether the values assigned to certain criteria were reasonable or appropriate and whether the Corporation had obtained sufficient information on the firms to make an informed decision.

46. Though in tendering the construction contract the YEC issued a request for proposals on 24 November 2000, it was not until about a month later that it sent out the design-build agreement, a key component of the proposal package. The invited firms raised many questions seeking clarification of the proposed work and, at their request, the closing date for the bids was extended from 23 January 2001 to 6 February 2001. The Corporation received three bids, but disqualified two of them for failing to comply with the mandatory requirements of the request for proposals. According to the Corporation, one disqualified firm failed to provide the required security and insurance information and to submit the exact proposal form; the other disqualified firm added conditions or qualifications to its proposal. As a result, there was only one valid bid. The YEC opted to negotiate with the firm rather than re-tender the contract. The selected firm (Chant Construction Company Inc.) was ranked lower than several other companies that had been evaluated at the pre-qualification stage.

47. At a meeting with the selected firm in February 2001, Corporation representatives identified a number of concerns about the firm's proposal. For example, they noted that it lacked several items in the scope of work set out in the proposal. They noted that the proposal had no procurement plan and

no formal safety program. In addition, some unit prices in the proposal were not consistent with the scope of the work.

48. During the construction contract negotiations in March 2001, the Corporation also became aware that the firm lacked experience in energy transmission and substation construction. For this project, the firm planned to rely on a series of individual specialists who were widely distributed throughout central Canada. It does not appear that the Corporation appropriately considered re-tendering the contract once these concerns came to light. It signed the construction contract (design-build agreement) on 11 April 2001, at a negotiated fixed price of $22,070,790.

49. **Contracts for the project manager and project engineer.** When the board of directors approved the project, the Corporation indicated that it would engage a contractor to act as project manager. The Corporation subsequently established an amount of $800,000 as the forecast cost of project management. It awarded a sole-source contract to one firm to act as project manager and another sole-source contract to another firm to act as the project engineer. The Corporation treated project engineering services as part of internal project management costs. By the time the project was completed, the Corporation had paid over $2.3 million in total to these two firms. It indicated to us that the project required a far higher level of project management support than had been expected. We identified significant deficiencies in these contracts—in particular, a lack of safeguards to protect the interests of the Corporation.

50. The project manager contract was not awarded on a competitive basis. In July 2000, the Corporation identified the project manager through a local human resources company, from a list of seven potential candidates. Only one candidate (Ian Hayward, principal of a firm called Windrush Engineering) was available and interested in the project. However, the Corporation did not look elsewhere for additional candidates. Initially, it contracted with the firm to provide consulting services relating to the invitation and selection of contractors for the construction of the transmission system project. The consulting work was scheduled to be from August to October 2000 and for a maximum of $30,000 (plus GST). The contract price was later increased to $70,190 for additional work, and the completion date was extended to 31 May 2001.

51. In September 2001, the Corporation entered into a project management contract with the same firm; the contract was retroactive to 1 June 2001. The Corporation would pay the project manager based on actual hours incurred in 2001 and 2002 (the project manager was expected to work an average of 150 hours per month), plus reimbursable expenses. We found that the contract did not specify a maximum price or ceiling and did not contain any provision for auditing claims.

52. Under the initial contract for consulting services and the subsequent contract with the same firm for project management, invoices submitted by the project manager show that the YEC paid a total of $424,455. Each invoice claimed a number of hours, but we did not find any detailed time

sheets submitted with the claims. We also noted that the Corporation reimbursed the project manager about $6,000 for entertainment expenses (on meals and alcoholic beverages with executives of the construction contractor and project engineering firm and with YEC staff and consultants) that were not provided for in the contract.

53. The contract with the firm acting as project engineer was also awarded without competition. It appears that no attempt was made to get competitive bids for this contract, and we found no explanation in the Corporation's files to justify this approach. We found no evidence that the board of directors approved a contract for engineering services on this project. We also noted that the project manager (Ian Hayward) was the founder of the engineering firm (Ian Hayward International Ltd.) and a director of this firm until 1995. The YEC knew of this relationship and issued the two sole-source contracts without raising any questions about it.

54. While the Corporation treated project engineering services as part of internal project management costs, using this engineering firm was contrary to the design-build concept as proposed by management—to employ a small project management team with only one contractor acting as project manager. According to the contract, under the direction of the project manager, the engineering firm's field office staff (one resident engineer and assistant, four field inspectors, and one field office manager) and staff at its head office and other locations (a resident engineer and assistant, field inspectors, principals, senior and junior engineers, draftsperson, technician, and secretary) would provide engineering services. The Yukon Energy Corporation would pay the project engineering fees, based on time spent, and reimbursable expenses. The agreement did not specify a maximum price or contain provisions for the Corporation to audit the claims if necessary. The agreement took effect on 3 May 2001, although the two parties did not sign it until September 2001. We found that the firm submitted an invoice for about $10,000 for services performed in April 2001, which indicates that it had begun work before the effective date of the contract. In our view, entering into contracts retroactively and allowing work to be performed before contracting arrangements have been completed is not an acceptable practice.

55. The contract was signed on behalf of the Director, Technical Services, by a Corporation employee at a supervisor level who did not have the authority to enter into the contract. This employee was not an officer of the Corporation. The Corporation's signing authority guidelines require one director (of the board of directors) and one officer of the Corporation to sign together to initiate expenditures of more than $500,000 for operations and maintenance (and for capital expenditures of more than $1,000,000), with the prior approval of the board of directors. At 31 May 2004, the Corporation had paid nearly $1.9 million to the engineering firm. The expenditures on this contract alone thus exceeded by far the $800,000 that the Corporation had budgeted for internal project management costs.

56. The YEC did not require the project engineer to submit any detailed time sheets to support the hours claimed, except for August 2001. For that month, concerned about the amount of time claimed for principals of the firm, the Corporation asked for a breakdown of the hours they had worked and on what matters. We also noted that in May 2002, the project manager wrote to the Corporation about the invoice submitted by the project engineer for April 2002. The project manager stated that he could support all charges except the charge for the principals' time ($10,290). He indicated that he had no yardstick by which to measure their input, other than a time sheet. Nonetheless, the project manager recommended that the claim be paid, and the Corporation paid the invoice without questioning it further. Corporation officials told us that the project engineer also provided information on the charges for two other invoices (October and December 2003) as requested by the Corporation.

57. **Other contracts.** We identified a number of deficiencies in other contracts related to this project. For example, in several contracts the Corporation paid the contractors more than the specified maximum contract price without having prepared formal contract amendments. In one other case, there was no written contract for goods and services involving payments of about $136,595. This was made solely on the basis of invoices submitted by the contractor.

58. In summary, we identified significant deficiencies in contracting for construction and services. The Corporation had no established contracting policy and no clear contracting procedures to provide for transparency and competition and ensure best value. It awarded many contracts on a non-competitive basis. We found that the contract for project engineering services was not properly planned for and authorized. In addition, the contracts for the project manager and project engineering services did not include adequate safeguards to protect the interests of the Corporation.

59. **Recommendation.** The Yukon Energy Corporation should establish and follow a contracting policy and clear contracting procedures that provide for transparency and competition and ensure best value. It should ensure that

- contracting requirements are properly planned for;
- contracts are entered into only by those who have the authority to do so;
- contracts clearly specify deliverables, maximum price, and cost ceilings;
- contracts include provisions for auditing claims, where appropriate; and
- payments are made only within authorized limits.

Management's response. The Corporation had its contracting and purchasing practices reviewed by a consultant in 2004. As a result, new contracting policies and guidelines have been developed and approved by the board of directors, which will address the points raised.

Management of project implementation

Numerous problems encountered during project implementation

60. Many problems arose during the implementation of the project. These included

- trespassing on First Nations lands,
- rerouting around the Dawson City Airport,
- disagreement over the survey data and soil conditions,
- timber removal,
- vibration problems with the transmission line, and
- unsatisfactory design documents and drawings.

As well, there were numerous disputes between the Corporation and the construction contractor. The Corporation alleged that the contractor failed to comply with certain contractual obligations, while the contractor alleged interference by the Corporation and the project manager. Some of these problems could not have been anticipated during the planning phase, but a number of them can be attributed to the Corporation's poor planning, communication, and project management. These problems resulted in additional costs, unresolved disputes between the Corporation and the construction contractor, and delays in completing the project.

61. **Violation of land use permit and trespassing on First Nations land.** The Corporation alleged that the construction contractor failed to get prior approval for temporary access to lands in the Mayo district and violated the land use permit. The Corporation also believed that the construction contractor did not apply responsible route planning practices, resulting in the trespassing on First Nations lands. Indeed, the YEC acknowledged that the contractor had cleared a parcel of First Nations land without proper authorization, and the First Nations concerned requested compensation for damages to their land. The construction contractor told us that it expected that the YEC would have obtained all necessary easements and rights-of-way as required under the contract. At the time of our audit, the Corporation was seeking an indemnification of about $119,000 from the construction contractor for the costs incurred as a result of trespassing.

62. **Rerouting around the Dawson City Airport.** The Corporation indicated that in the early planning stages (for example, during the feasibility study), it was not aware of any expansion plans at the Dawson City Airport. Shortly after design work had begun, the Corporation realized that airport expansion plans were underway and there were provisional zoning regulations introduced for the airport. This would require the rerouting of the transmission line around the Dawson City Airport. In August 2001, the Corporation considered several alternative routes and selected the Australian Mountain/Hunker Creek route to replace the original route. Based on a cost analysis prepared by the construction contractor, the Corporation estimated that the route change would cost about $600,000. In November 2001, the Corporation asked the construction contractor to price a change order for the route change. The contractor responded in May 2002 with a request for a change order of about $1.2 million, but the Corporation rejected the

contractor's estimates. By then, a substantial amount of work was already in progress. The construction contractor indicated to us that it proceeded with this change in the scope of work without insisting that all of the costs be identified and pre-approved in order to preserve the project schedule. The Corporation paid the contractor about $650,000, but it did not issue a formal change order; it felt that it would be difficult and time-consuming to assess a payment for work that had already been completed. The Corporation decided that claims by both parties would be assessed as a package after commissioning of the project. In October 2003, the contractor submitted two claims totalling about $1 million for rerouting work, in addition to the $650,000 already paid. At the time of our audit, the Corporation was disputing the two claims.

Soil conditions can affect the installation of wood poles.

63. **Survey data and soil conditions.** When the Corporation met with the construction contractor in February 2001 to negotiate the construction contract, its officials noted that the contractor's proposal did not make use of the remote survey information included in the request for proposals. The Corporation believes that this was largely because of the contractor's lack of knowledge of this type of information. Later, the project manager also indicated that, in his opinion, the construction contractor did not understand how to use the survey data. The contractor, however, claimed that the survey data were not as accurate as the request for proposals had indicated; it had therefore had to obtain the information by other means in order to complete the detailed design of the transmission line. The contractor also claimed that on-site conditions differed from the soil reports included in the request for proposal.

64. In October 2003, the contractor submitted a claim of $750,000 for costs related to inaccuracies in the survey data, and another claim of $612,630 for additional costs related to unforeseen soil conditions that affected the installation of the wood transmission poles. The Corporation is disputing these claims.

65. **Timber removal.** In March 2000, the Corporation entered into an agreement with two First Nations giving them the first right to take possession, at their own cost, of salvageable timber cut as part of this project, although they were not obliged to do so. Under the agreement, the timber had to be removed within two years after it was cut.

66. In the planning phase of the project, the Corporation did not anticipate any significant costs for timber removal and salvaging. As a result, the removal of cut timber was not included in the design-build agreement. During the construction phase, however, the Corporation had to pay about $400,000 to the contractor and the contractor's subcontractor to have timber removed to locations specified by the two First Nations. It did so to ensure that the project met the terms of the timber removal permit, which required it to clear the timber by 31 March 2002, and because the two First Nations were not satisfied with the amount of salvageable timber left for them. The Corporation claimed that the clearing methods used by the contractor's subcontractor had destroyed a lot of timber. The construction contractor, however, believes that its clearing methods were adequate and effective.

Workers install the transmission line.

67. **Line vibration problems.** After an earthquake on 3 November 2002, the Corporation investigated and analyzed vibration problems associated with the tension of the transmission line. The Corporation alleged that the line tensions are too high, leaving the transmission line susceptible to vibration under certain conditions and the possibility of premature failures. The Corporation believes that it is the construction contractor's responsibility to install dampers on the line to mitigate the effects of vibration. In October 2003, the Corporation submitted a claim of about $1 million for this alleged deficiency, which the contractor is disputing. The contractor believes that the tension of the transmission line met project specifications.

68. **Relationship between the Corporation and the construction contractor.** In April 2002, the Corporation's Advisor to the Board of Directors reported that the most serious issue at that time was the relationship between the Corporation and the construction contractor. Fundamental to this issue was a letter of March 2002 from the Corporation to the contractor's bonding company, in which the Corporation expressed concerns about how the contractor was performing relative to the contract. The contractor took exception to the Corporation's opinion and requested that the letter be withdrawn, but the Corporation refused. In October 2003, the contractor submitted a claim to the Corporation for $6 million, indicating that because of the Corporation's alleged misrepresentation to the bonding company, it had been unable to bid on several projects that would otherwise have been available to it.

69. In addition, the contractor submitted two claims to the Corporation totalling $1.65 million, alleging that the Corporation and the project manager had interfered with the means, methods, and scheduling of work by the contractor and subcontractors. At the same time, the Corporation submitted claims to the contractor totalling about $5.8 million for a late-completion penalty, costs resulting from late completion, and extra project management costs. All of these claims were unresolved at the time of our audit.

70. **Design and drawings.** Under the design-build agreement, the construction contractor was required to prepare and provide detailed construction documents to the Corporation for approval before beginning construction work at the substations. These documents were to include design drawings and specifications setting out all the requirements necessary for the proper construction of the transmission system project. But the Corporation had difficulty obtaining satisfactory design documents and drawings from the construction contractor. The construction contractor told us that a significant difference of opinion existed between the two parties as to the requisite standard to be met.

71. In some cases, the contractor asked that it be allowed to start construction before it had completed the designs and drawings. The Corporation told us it had agreed to these requests in the interest of trying to move the project forward. For example, in August 2002 it allowed civil construction work at the substations to proceed although the overall design drawings had not been completed and approved. The installation of

substation equipment followed, before concerns about the design drawings had been fully addressed. Later, having identified a number of problems, Corporation staff became concerned that the drawings being used on the work site were not accurate. When the Corporation found that there had been virtually no advancement in the drawings, it decided in early February 2003 to suspend work because of safety concerns and problems seen in the field. Meanwhile, there was no complete, detailed plan for commissioning the transmission system.

72. It took several months for the two parties to resolve the impasse over the adequacy of drawings and commissioning plans, deficiencies in construction, and other issues. In May 2003, they agreed to establish an action plan for completing the project. They also appointed an impartial referee to resolve disputes between them. On 27 May 2003, the minister responsible for both the Yukon Energy Corporation and its parent, the Yukon Development Corporation, appointed a new Chair to the Board of Directors of the Yukon Development Corporation (who also became the Chair of the YEC Board of Directors). A primary function of the new Chair was to resolve the issues surrounding the transmission system project.

73. While the original target date for project completion was 1 November 2002, the transmission system was only commissioned on 5 September 2003, which was set by the referee and agreed to by the parties. As of that date, the project achieved a substantial completion status (work was 95 percent complete) although drawings were still incomplete, and there appeared to be a number of deficiencies that remained outstanding. For example, there were issues related to improper cable terminations, inadequate building ventilation, and minor non-completed items. In January 2004, the Corporation accepted delivery of the "as built" drawings as they existed on 23 December 2003. In doing so, it agreed that the construction contractor would be deemed to have satisfied the contractual obligations with respect to the delivery of drawings.

74. In summary, we identified numerous problems during the implementation of the project. Many of them are due to the Corporation's poor planning, communication, and project management. They have resulted in additional costs, unresolved disputes between the Corporation and the construction contractor, and delays in completing the project. The construction contractor acknowledges that it bears responsibility for some of the problems encountered on the project. For example, it executed the design-build agreement without insisting on major changes to the contract knowing that there were problems with the contract documents. It believes that the design-build agreement was incoherent and did not properly articulate the expectations or responsibilities of the two parties under a conventional design-build protocol.

75. **Recommendation.** In implementing capital projects, the Yukon Energy Corporation should

- apply good project management practices,
- ensure compliance with contract provisions,

- issue formal change orders where necessary,
- ensure that work does not proceed unless authorized, and
- monitor work, so that when problems arise, appropriate action can be taken on a timely basis.

Management's response. The practices identified by the Office of the Auditor General are being addressed. While the deviations from the "best practices" listed are generally unique to the Mayo-Dawson project, management will ensure that the recommendations are applied to all future projects, regardless of size and complexity.

Significant claims in dispute despite agreement that project was complete

76. The design-build agreement contains dispute resolution clauses including the use of negotiation, mediation, and arbitration (with specified time limits outlined). However, we found that neither party relied on these provisions.

77. As noted already, construction work was suspended in February 2003. It was not until May 2003 that the two parties entered into a supplemental agreement in order to complete the project. As part of this agreement, they appointed the referee to resolve disputes between them. Under the design-build agreement, the two parties were expected to make all reasonable efforts to resolve disputes through negotiations. The resolution of a number of issues with the help of the referee led to the project's completion, but many claims remain unresolved.

78. On 2 October 2003, the referee directed both parties to submit their final list of claims by 15 October 2003. The construction contractor submitted a total of about $17 million in claims for numerous issues. The Corporation submitted a claim of $9.5 million for extra project management costs, delays in completion, and other issues. We make no comment on the merits of either of these claims.

79. On 16 January 2004, the two parties entered into an agreement that the project was complete and settled a number of issues. The referee's work also ended that month. At the time of our audit, there was no agreement between the two parties on how and when to settle the final claims. They did not use the provision in the design-build agreement that either party may refer a dispute to arbitration for final resolution.

80. We noted that the Corporation has incurred a significant amount of time, effort, and money engaging lawyers and consultants to assist in resolving the outstanding claims. While the Corporation has made efforts to move the claims process along, it has not had much success. Whatever the outcome, it is important that additional costs incurred by the Corporation are properly accounted for as part of the project costs.

81. **Recommendation.** In implementing capital projects, the Yukon Energy Corporation should make use of dispute resolution provisions in contracts and agreements to resolve disputes with contractors in an efficient and timely way.

Management's response. Management will use dispute resolution provisions where it is appropriate and in the best interests of the Corporation.

Financial management and project cost controls

Inadequate financial management and project cost controls

82. When undertaking a project similar in size and nature to the transmission system, we would expect an organization to have adequate financial management and project cost controls to ensure that the scope and costs of a project remain within budget and that all change orders and cost overruns are properly authorized. In this project, however, we identified shortcomings in these areas.

83. The Corporation's staff had difficulty reconciling the detailed budgets and variance analyses to the original cost estimates approved by the Boards of Directors of the Corporation and its parent corporation. While the YEC set up several codes in its financial accounting system to record the costs incurred on this project, we found them inadequate for monitoring and reporting project costs against budgets. In 2004, it took the Corporation several months to complete a reconciliation of the actual project costs with the original estimates and approved costs.

84. We found that internal costs were not properly controlled. According to the Corporation's data, expenditures on internal costs of this project totalled about $8.3 million although the original budget was estimated at $1,825,000 (Exhibit 3). These costs included such items as the feasibility analysis, tender preparation, internal project management, staff and travel costs, overhead costs, insurance and legal costs, consultants' and contractors' fees, and other related expenditures. For example, project management costs amounted to about $2.6 million, whereas the Corporation had budgeted $800,000; and staff and travel costs amounted to $1.1 million against the budget estimate of $50,000. The Corporation indicated that because of the numerous problems encountered during the project construction and commissioning, the project required a far higher level of staff involvement than expected.

85. Under the construction contract, the Corporation could make changes in the construction work through a change order or a change directive. A change order is a written order signed by the YEC and acknowledged by the construction contractor to authorize an addition, deletion, or revision in the scope of work or a change in project schedule or price.

86. A change directive is a written order signed by the YEC to direct an addition, deletion, or revision in the scope of work before the two parties agree on the adjustment to the contract. A change order would be recorded once both parties agreed on the contract adjustment.

87. We expected that change orders would have been formally issued for all changes in the work on which the Corporation and the construction contractor had initially agreed. The design-build agreement originally set a fixed price of $22,070,790. Subsequently, the Corporation approved nine change orders with payments amounting to about $1.3 million. However, as mentioned in paragraph 62, the Corporation paid the contractor a total of $650,000 without a formal change order. Moreover, several change orders

Exhibit 3 Summary of Yukon Energy Corporation's internal costs for the transmission system project ($ thousands)

	Original budget	Adjusted budget	Expenditures (31 May 2004)
Project management	150.0	800.0	2,567.0
Feasibility, tender preparation, licence, permits, etc.	1,525.0	1,737.5	1,649.0
Corporation staff costs	100.0	50.0	1,146.0
Legal	0.0	0.0	911.0
Contractors	0.0	0.0	818.0
Consultants	0.0	25.0	347.0
Insurance	0.0	0.0	344.0
Overhead	50.0	50.0	226.0
Materials	0.0	50.0	196.0
Other	0.0	0.0	75.0
Total	**1,825.0**	**2,712.5**	**8,279.0**

Source: Yukon Energy Corporation

were still in dispute after the project had been completed; the contractor is seeking an additional $1.1 million.

88. We noted that the Corporation paid $273,683 to the construction contractor for work performed pursuant to change directives, but no formal change orders for that work were ever made. An additional $780,371 claimed by the construction contractor for work performed pursuant to change directives was in dispute at the time of our audit.

Significant cost overruns incurred

89. We noted that the Corporation's Board of Directors received regular reports on the progress of the project, mostly through the president or the advisor to the board. Management identified potential cost overruns as early as March 2002. However, there were no controls or established procedures to authorize cost overruns and approve payments above the authorized limits for this project. There was no evidence that management ever asked the board of directors to approve any cost overruns and it never formally approved any.

90. At 31 May 2004, the Corporation had spent about $33.5 million on this project (Exhibit 4). This exceeded the authorized total costs by about $4.5 million, mainly due to scope changes (various change orders and directives), unforeseen construction contingencies (for example, earthquake investigation, trespassing on First Nations lands, and a referee to resolve contract disputes), extra project management costs, and underestimated and unbudgeted costs (for example, staff support, legal, insurance, and timber removal).

Exhibit 4 Mayo-Dawson City transmission system project—Authorized costs compared with expenditures ($ thousands)

	Authorized costs	Adjusted budget*	Expenditures (31 May 2004)
Feasibility study	400.0	0.0	0.0
Construction	23,175.0	23,865.5	23,676.0
Internal costs**	1,825.0	2,712.5	8,279.0
Interest and inflation	2,246.0	2,246.0	1,575.0
Additional items (rural electrification and conductor upgrade)	1,400.0	222.0	0.0
Total	**29,046.0**	**29,046.0**	**33,530.0**

*Adjusted budget reflects reallocations of money between categories.

**Internal costs included such items as the feasibility analysis, tender preparation, project management, staff and travel costs, overhead costs, insurance and legal costs, consultants' and contractors' fees, and other related expenditures.

Source: Yukon Energy Corporation

91. In November 2003, the Corporation indicated that the total cost of the project would be about $36.2 million, representing a cost overrun of about $7 million. However, this does not take into full account all the claims submitted by the construction contractor and counterclaims by the Corporation that were still in dispute at the time of our audit. As we indicated earlier in this report, the investment in this project could be justified if the capital costs did not exceed $38.2 million. We are concerned that the substantial cost overruns significantly reduce the savings that can be expected from this project. Coincidentally, because of recent large increases in diesel fuel prices the prospects for the benefits of this project look more promising.

92. **Recommendation.** The Yukon Energy Corporation should establish sound financial management and cost controls for implementing capital projects. Such controls should ensure that the scope and costs of projects remain within the approved budgets and that change orders and cost overruns are properly authorized.

Management's response. While the internal control systems at the Yukon Energy Corporation have generally been found to be free of material weaknesses, management acknowledges that the execution of the Mayo-Dawson project circumvented normal processes and controls. The situation should be prevented in the future as a result of process changes and improvements in corporate governance.

Adherence to original specifications

Deficiencies remain in final delivered product

93. The design-build agreement sets out in detail the requirements that the contractor must perform and adhere to in the design, construction, and commissioning of the project. It includes a statement that the intent of the agreement is to produce "first class design and construction work". It also stipulates adherence to standards of the electric utility industry.

94. As already noted, the design-build agreement clearly set out the contractor's obligation to submit drawings to the YEC for approval before commencing work. In a project of this nature, it is important that accurate, certified drawings be available before construction begins. This did not happen. Indeed, the problems encountered during commissioning and the deficiency list prepared by the Corporation showed design and wiring errors, equipment adjustment problems, and poor workmanship. The contractor, however, believes that its drawings met industry standards.

95. The design-build agreement also required the contractor to apply to the Corporation for a "certificate of total completion" once all the construction work had been completed to meet the requirements of the contract and all deficiencies had been rectified to the Corporation's satisfaction. The Corporation would then issue the certificate and pay the contractor the unpaid balance of the contract price including the performance holdback.

96. In January 2004, the Corporation issued the above certificate after the two parties had entered into the agreement mentioned in paragraph 79 of this report. The Corporation agreed to release the construction contractor from its warranty obligations under the contract in the transmission line component of the work. This release did not apply to the contractor's warranty obligations for any other component of the work, including the substation component. The Corporation also agreed that, except as otherwise indicated in the agreement made on 16 January 2004, the construction contractor would not be responsible for the deficiencies and incomplete work previously identified by the Corporation, agreed on by the two parties, or determined by the referee.

97. In agreeing on the completion of the project, the Corporation and the construction contractor came to a compromise on the drawings of the transmission system. The Corporation accepted delivery of the drawings as they had existed on 23 December 2003 and agreed to complete them itself.

98. The Corporation believes that there was a design deficiency in the transmission line, because it is susceptible to vibration as a result of the high conductor tension. This could increase the costs of maintenance and operations over the life of the project. In late 2004, the Corporation contracted with a company to install vibration dampers on the line at a cost of about $1 million.

99. The Corporation also claimed that the construction contractor did not meet contractual obligations to use certain "low loss" specifications for major pieces of electrical equipment (including transformers, reactors, and the synchronous condenser). The Corporation believes that this will result in higher costs of energy for the life of the project because the equipment installed consumes more power than was planned for and specified in the agreement. The Corporation submitted a claim of $530,000, which the contractor has disputed.

100. At the end of the audit fieldwork, the Corporation advised us that only a few outages had occurred since the transmission system became operational in September 2003. Although the design-build agreement specifically stated that the Corporation's intent was to receive "first class design and construction work," in light of the many deficiencies and problems encountered during construction and commissioning of the project it appears that this intent was not met.

Rate review by the Yukon Utilities Board

Need for a comprehensive examination of project costs

101. The YEC is committed to the position that this project will have no adverse impact on ratepayers. Considering the significant cost overruns incurred by the Corporation in implementing this project, we believe it would be important for the Yukon Utilities Board to undertake a comprehensive examination of the project's capital and operating costs as well as any outstanding problems when the Corporation seeks to recover the costs of the project. This would help to determine whether or not the project has any negative impact on electricity rates.

Conclusion

102. The Mayo-Dawson City transmission system project is the largest capital project the YEC has ever undertaken. However, the Corporation lacked the experience and expertise to carry out a project of this nature and magnitude. While the need, feasibility, and benefits of the project were well justified, the project scope and costs were not adequately defined. The YEC's Board of Directors was not fully briefed about the risks associated with using the design-build approach for this project without the required experience and expertise. Nor did the board of directors and management ensure that the Corporation established sound policies and practices or provided sufficient oversight and control over the implementation of this project.

103. The Corporation does not have a policy that establishes standards and procedures for project management. Project management was weak. Roles, responsibilities, and accountability were not clearly defined. Numerous problems and significant delays were encountered in implementing the project. Deficiencies remain in the final delivered product. It does not appear that the intent of the Corporation—to receive first class design and construction work—was met.

104. We identified significant deficiencies in contracting for construction and services. There was no established contracting policy to require that contracts be awarded on a competitive basis and no clear contracting procedures, including established financial limits or thresholds.

105. Financial management and project cost controls were inadequate. There were significant cost overruns in completing the project. We are concerned that the substantial cost overruns significantly reduce the savings that can be expected from this project. As the YEC is committed to the position that this

project will have no adverse impact on ratepayers, we believe it would be important for the Yukon Utilities Board to undertake a comprehensive examination of the project's costs when the Corporation seeks to recover them.

About the Audit

Objectives

To determine the extent to which the Mayo-Dawson City transmission system project

- was adequately defined in terms of scope, costs, and benefits;
- was subject to appropriate project management, control, and accountability; and
- resulted in a quality product that met original specifications.

Scope and approach

The audit examined key aspects of the Mayo-Dawson City transmission system project activities, including

- feasibility and cost-benefit analysis,
- overall project management,
- contracting practices,
- management of project implementation,
- financial management and project cost controls, and
- adherence to original project specifications.

We reviewed project files, financial management systems, and project cost control systems. We also interviewed program managers and corporation officials. We did not examine the records of the contractors.

Audit criteria

- The need for the project should be well defined and should be directly related to corporate objectives.
- Feasibility and options that could potentially fulfill defined requirements should be identified and analyzed.
- The selected option for developing and implementing the project should be translated into a project that clearly states objectives and contains work packages, schedule, budgets, organization, and controls.
- Contracting should
  - conform to established policies;
  - be based on requirements arising from the project definition;
  - incorporate authorized changes; and
  - be in keeping with well established principles including project organization, budgeting, scheduling, control, and reporting.
- The design-build process should be clearly defined in terms of design and drawing requirements, and those requirements should be communicated to the parties responsible for design.
- Overall project management should be in accordance with well established principles of project management.
- The project requirements should be satisfied and the project commissioned with minimum cost and disruption.
- The end product should meet the original specifications.
- Appropriate project accounting and financial controls should be in place.
- Responsibility and accountability should be clearly defined and communicated.

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