Information Services Corporation – LAND Project

Executive summary

The LAND Project is a major investment that will transform the old paper-based Saskatchewan land titles system into an electronic system. The system also integrates land records with electronic maps and survey plans. The LAND Project is more than an information technology project. It includes major changes in policies, revenue model, business processes, culture, legislation and regulations, and ongoing organizational development. The projected budget is $58 million. Information Services Corporation (ISC) stated that the expenditures on the LAND Project to October 2001 are $38 million.

The objective of our audit was to assess whether ISC had adequate project management processes to implement the LAND Project. We focused on the project management processes ISC used to manage the implementation of this project in Moose Jaw. We have not assessed the merits of the LAND Project. That is a matter for the legislators and the public to debate.

The pilot implementation in Moose Jaw revealed problems that need fixing. This is normal given the size and complexity of the Project. ISC has recognized that it needs to make improvements in its processes to register titles, convert documents, improve computer performance, and train and support users. ISC informed us that it plans to make these improvements before implementing the LAND System in Regina.

Overall, we found that ISC had adequate project management processes to implement the LAND Project except for processes to measure, verify, and report on the LAND Project benefits. ISC demonstrated strong management commitment and adequate project management practices. We make five recommendations to help increase the likelihood that ISC will successfully complete this major project. We recommend that ISC should:

♦   strongly encourage key outside users to take training before conducting business using the LAND System and that ISC continue to monitor outside user feedback;

♦   set measurable and verifiable LAND Project benefits and report publicly on the achievement of all planned benefits;

♦   perform a post-implementation review of the LAND Project and make the results available to all government organizations;

♦   receive monthly reports on the comparison between actual costs to date on the LAND Project to the budget to date; and

♦   complete, test, and approve its business continuity plan.

2

Introduction

We are reporting on the Land Titles Automated Network Delivery system (LAND) Project in two stages. In our 2001 Spring Report, we described the criteria we intended to use to audit the project management processes used by Information Services Corporation (ISC) to implement the LAND Project. In this chapter, we describe the results of our audit.

The LAND Project is a large complex project that will transform Saskatchewan's paper-based land records at land titles offices into an electronic system (LAND System). Cabinet approved the LAND Project budget, early in 2000, at $58 million. The LAND System will integrate land records with the survey plans and the Saskatchewan Geographical Information System (GIS) formerly managed by SaskGeomatics Division of the Saskatchewan Property Management Corporation. The LAND Project will convert over one million titles and over 120,000 survey plans to electronic records.

The LAND Project is more than an information technology project. It includes major changes in policies, revenue model, business processes, culture, legislation and regulations, and ongoing organizational development. It will also convert millions of pages of paper documents to electronic records, reduce the number of staff in land title offices, and train staff and other LAND System users. ISC will also warehouse in Regina over four million cancelled titles and 6.5 million other land titles instruments, including mortgages and caveats.

The Government expects its investment to:

♦ reduce the time it takes to transfer or change a land title to less than 48 hours;
♦ reduce certain operating costs of the registration processes;
♦ provide Internet access to land titles;
♦ provide electronic registration and search services for land titles;
♦ simplify the registration processing rules;
♦ improve record-keeping integrity and security; and
♦ create new sources of revenue as primary users and the public can search titles, mineral ownership, maps, survey plans, and related information with their computers.

After the conversion, the official land title will be an electronic record. The LAND System will tie electronic titles into the GIS, which is an electronic map of Saskatchewan that is detailed enough to show city lots. The LAND Project also merges the eight land titles offices, the Chief Surveyor's Office, and SaskGeomatics into the ISC. The primary users of the LAND Systems are lawyers, surveyors, financial institutions, and provincial and local governments. Having many outside users presents unique challenges to ensure that their needs are met and that they receive adequate training and support to make effective use of the system.

ISC stated that the expenditure on the LAND Project to October 2001 are $38 million on a projected budget of $58 million. ISC is currently implementing the LAND System in Moose Jaw as a pilot because it is a small, less complex district and therefore is suited to pilot test the new LAND System. Regina is scheduled next and is much riskier because it is larger and more complex than Moose Jaw.

The pilot revealed problems that need fixing. This is normal given the size and complexity of the LAND Project. ISC has recognized that it needs to make improvements in its processes to register titles, convert documents, improve computer performance, and train and support users. ISC informed us that it plans to make these improvements before implementing the LAND System in Regina and the rest of the Province.

Surveys and literature show that large information technology (IT) projects are inherently risky and face many difficulties. Sound project management processes can reduce these risks and increase the likelihood of a project's success. We carried out this audit to provide the Legislative Assembly and the public with independent assurance on whether ISC has adequate project management processes to implement the Project. The audit allowed us to determine the strengths of ISC's processes and to identify opportunities for improvement. We expect the results of the audit to help ISC and other government organizations strengthen their project management practices.

History of the LAND Project

It is helpful to have an overview of the history of the LAND Project to understand the current project issues. In 1994-95, the Department of

4

Justice (Justice) received Treasury Board approval to design an automated land titles system. At that time, the LAND Project consisted of the conversion of land titles into electronic records and a computer system to register and record land records. Justice estimated the cost of the LAND Project at $20 million.

In 1996, Justice was asked to explore integrating the proposed Land Titles system to the GIS, thus creating a joint venture between Justice and SaskGeomatics. Integrating land titles to GIS significantly expanded the scope and the related risks of the LAND Project. In April 1998, after the design was substantially complete, Justice tendered for a contractor to help, build and implement the LAND System. Justice also hired the contractor to ensure it had the expertise to succeed with the LAND Project and a partner to share some of the project's risk.

In 1999, the estimated cost of the LAND Project increased to $58 million due to costs for: 1) tying land titles to GIS, 2) hiring a contractor, 3) increasing the estimate of storage and conversion costs, and 4) adding a contingency fund of 10% to pay for unplanned work.

In 1999, Justice still needed to get a secure source of revenue for each of the next three years to ensure it could complete the LAND Project. Justice did not have access to the land title revenue because it went directly to the General Revenue Fund (GRF). Justice had to compete annually with other government programs to get revenue from the GRF to pay for the LAND Project. Financing this long-term project on a year-by-year basis is risky because in any year, money may not be available due to other Government priorities. The LAND Project experienced delays waiting for money. To help secure money for the LAND Project, Justice updated its business plan requesting that Cabinet approve the establishment of a Crown corporation, to build and operate the LAND System.

In January 2000, Cabinet approved the establishment of a Crown corporation under the Crown Investment Corporation of Saskatchewan (CIC) and later named it the Information Services Corporation. Later, the Corporation received approval to obtain financing of $60 million. The LAND Project now had access to the land title revenue and long-term financing to complete the project without further financing delays. Setting up the Crown Corporation came with a cost. ISC had to increase its fees

5

to compensate the GRF $8 million for lost revenue from land title fees and still make an adequate return as a Crown. Although the LAND Project was approved in principle in 1996, it needed to be moved to a Crown in order for it to obtain secure financing because of the limitation imposed by the accounting and budgeting practices of the GRF. These limitations do not necessarily support good management decisions.

ISC planned to start the implementation of the LAND System and the conversion of the land tiles in Moose Jaw in May 2001 and to complete the implementation throughout Saskatchewan by the summer of 2002. ISC delayed the initial Moose Jaw implementation by six weeks, to late June 2001. ISC has also delayed the Regina implementation until ISC is satisfied the LAND System meets the outside users needs. ISC told us that the forecasted cost of the project is still $58 million and that all districts will be implemented by the summer of 2002.

Audit objective and scope

The objective of our audit was to assess whether ISC had adequate project management processes to implement the LAND Project up to July 2001. We focused on the project management processes ISC used to manage the implementation of the LAND Project in Moose Jaw. We followed the Standards for Assurance Engagements established by The Canadian Institute of Chartered Accountants.

The presence of good project management practices does not guarantee that the project will be completed on time, within budget and as planned. However, good project management practices greatly increase the likelihood of success. Studies have indicated that there are both potential benefits and risks associated with the LAND Project. We have not assessed the merits of the LAND Project. That is a matter for the legislators and the public to debate. However, we did audit the adequacy of ISC's processes to track and report on the realization of the LAND Project's planned benefits.

Audit criteria

Auditors use criteria to evaluate matters that they audit. The criteria described in the following paragraphs set out the practices that we expected ISC to use implementing the LAND Project. The criteria are

based upon international standards, literature, and reports of other auditors. Management agreed with the criteria.

In particular, we used the Project Management Institute's standard, entitled *A Guide to the Project Management Body of Knowledge 2000*, as the management framework to support the criteria. We also reviewed the Auditor General of Canada's reports, the Canadian Institute of Chartered Accountant's Criteria of Control (CoCo) and the Information System Audit and Control Foundation's *Governance, Control and Audit for Information and Related Technology* (CobiT) to ensure our criteria are appropriate.

To implement the LAND Project, ISC needed adequate:

♦   ways to maintain senior management and stakeholder commitment to the project;

♦   processes to track and report on the realization of the project's benefits; and

♦   project management practices and reports.

Audit conclusion and findings

We found that ISC had adequate project management processes to implement the LAND Project except for processes to measure, verify, and report on the LAND Project's benefits.

We make five recommendations to improve the likelihood of ISC successfully completing this major project. We recommend ISC should:

♦   strongly encourage key outside users to take training before conducting business using the LAND System and that ISC continue to monitor outside user feedback;

♦   set measurable and verifiable LAND Project benefits and report publicly on the achievement of all planned benefits;

♦   perform a post-implementation review of the LAND Project and make the results available to all government organizations;

♦   receive monthly reports on the comparison between actual costs to date on the LAND Project to the budget to date; and

7

♦   complete, test, and approve its business continuity plan.

To carry out our audit, we used a risk-based approach to identify and examine relevant project management processes. Sources of audit evidence included: LAND Project minutes, policies, decision documents, position descriptions, contracts, procedure manuals, project management plans and reports, and correspondence. We interviewed key officials of ISC. We also reviewed ISC and CIC minutes relating to the LAND Project.

Criterion 1 – Processes to maintain senior management and stakeholder commitment

Senior management commitment

We expected ISC to have project management processes to obtain and maintain strong senior management commitment to the LAND Project. Senior management commitment is a common and very important feature of successful projects. These processes become more crucial if a project spans many years, involves significant changes, and/or is very complex. We expected ISC to show senior management commitment by having good governance processes to help achieve its objectives, by being accountable to the Government for its success, and by showing strong leadership.

Good governance processes foster senior management commitment. We defined project governance as a set of relationships and processes to direct and control the organization in achieving the project's objectives. We looked at ISC's governance processes and the committee structure used to implement the LAND Project. Governing committees included the ISC Board, ISC Executive Committee, and the LAND Project Steering Committee. In addition, many other committees contributed to governance by monitoring and responding to issues about the development and testing of the LAND System. The committees contributed to good governance by addressing key issues and holding the project team accountable.

Accountability fosters commitment. Accountability starts with setting expectations for performance, followed by reporting on performance, and finally reviewing the organization's performance. ISC demonstrates

accountability by reporting regularly to CIC's Board on the progress of the project and publicly in its annual report. We discuss the measurement, reporting, and monitoring of expectations in Criterion 2.

Strong leadership also fosters commitment. In our 2000 Fall Report – Volume 3, Chapter 1A, we discuss the importance of leadership in government to implement an important initiative – performance reporting:

> The long-term commitment and support of legislators, ministers, and senior government officials is essential if the Government is to move to achieve, and be accountable for, results…

Justice, and later ISC, showed leadership throughout the project approval process. Prior to the establishment of ISC, management demonstrated commitment to the vision of an automated land system despite the delays caused by the uncertainty of financing for the LAND Project. It is critical to any project to have committed champions. The president and the senior project manager are the key champions of the LAND Project.

In conclusion, ISC showed strong senior management commitment to the LAND Project through good governance processes, proper accountability, and strong leadership.

Stakeholder commitment

Senior management obtains and maintains stakeholder commitment by seeking information about their needs, communicating how the project meets their needs, and training them to obtain the benefits of the system. Stakeholders include lawyers, realtors, surveyors, other departments, governments, and non-governmental organizations. Outside users are stakeholders who conduct business using the LAND System and do not work for ISC. It is also important that stakeholders be informed of, and have input into, the development of a project. This promotes stakeholder commitment and assists implementation. The following processes helped enhance stakeholder commitment to the Project:

♦   the project team consulted early with stakeholders to seek information about their needs;
♦   ISC delivered user training to outside users;
♦   ISC conducted surveys and meetings to get feedback from outside users on the implementation in Moose Jaw; and

9

♦   ISC used media releases, newsletters, meetings, and their Web site to keep the public informed about the LAND Project.

Maintaining stakeholder commitment presents unique challenges to ISC to ensure that stakeholder needs are met and that the outside users receive adequate training and support to make effective use of the system. The challenge is increased because of the long-term nature of the project and the challenges of getting people to accept a system that is very different from the old paper system. Because outside users are beyond its direct control, ISC cannot mandate training. Outside users' problems with system performance, registration processes, training and support are public problems. Problems can erode public confidence. ISC must continue to communicate with the stakeholders and strongly encourage key outside users to take the training before using the LAND System. We conclude that ISC had adequate processes to maintain management and stakeholder commitment to implement the LAND system in Moose Jaw. However, to improve the effectiveness of the LAND system:

1.   We recommend that Information Services Corporation should strongly encourage key outside users to take training before conducting business using the LAND System and that ISC continue to monitor outside user feedback.

Criterion 2 – Processes to track and report on realization of the LAND Project's benefits

We expected ISC to set quantifiable and verifiable benefits in its business case that were consistent with its vision, strategic goals, and objectives. The quantification of benefits and the measurement of results are key steps to accountability. We expected the business case to evolve to support key decisions and changing conditions.

Developing a strong business case is a critical process to selecting the right project and realizing the benefits of the project.

A business case puts the investment decision into a strategic context, and positions the business objectives and options that will affect both the decision and the investment itself. A business case provides the information necessary to make a decision

about whether a project should proceed. It is the indispensable first activity in the lifecycle of an IT investment.

A business case is a detailed investment proposal. It provides an analysis of all the costs, benefits and risks associated with a proposed investment and offers reasonable alternatives. [1]

The LAND Project's business case included objectives and outlined stakeholder needs. It also assessed alternatives for achieving objectives and meeting stakeholder needs. The alternatives considered were: improving the manual system; buying and adapting another jurisdiction's automated land system; or building a LAND System. The reasons for building a LAND System were given. Also, contractors were encouraged to use existing systems in their bids if it could meet the LAND Project needs.

The business case also included the estimated cost and anticipated benefits of automating the land titles. The quantifiable benefits were maintaining profitability and improving land title registration to less than 48 hours while keeping the eight regional offices. The business case also included the following qualitative benefits:

♦ consistent title processing across the province;

♦ simplified registration procedures;

♦ easier access to information;

♦ improved functions and services; and

♦ improved accuracy of titles.

The business case evolved from 1996, but still described only the two benefits in quantifiable terms. Other expected benefits, such as improved function and services, should be published with verifiable and measurable targets. ISC is unable to measure these benefits now because it did not set measurable targets.

---

[1] Project Management Office. Chief Information Officer Branch, Treasury Board Canada (February 1998). Creating and Using a Business Case for Information Technology Projects.

The business case assumed increased revenues and a drop in operating costs to meet its profitability targets. The business case stated that the fees would be set prior to the LAND System's implementation. ISC developed a land titles revenue model based on its anticipated volume of transactions, growth rate, adoption rate, and pricing to meet profitability expectations and Cabinet requirements. ISC based many of its fee decisions on historical volumes and these new fees must be monitored because some historical volumes may not directly relate to ISC's new processes. Estimating service levels is risky when there is little past activity to determine if predicted levels of services are reasonable. ISC hired an expert to give assurance that the model and assumptions are supported. The expert gave assurance that most of the historic volumes had support. ISC must closely monitor its achieved service volumes and revenues to ensure its fees are adequate to meet its return on investment. If volumes are less than expected, ISC may need to request a change in its fees from Cabinet. Cabinet approved the fees and announced them on June 21, 2001.

Important qualitative benefits were set out in the business plan. However, it is difficult to measure and report on the success of the LAND Project without verifiable and measurable targets for these qualitative benefits. Setting measurable performance targets and reporting on them would help ISC account for the success of the LAND Project.

We conclude that ISC had adequate processes to track and report on the realization of the project's benefits except ISC lacks measurable and verifiable targets for some of the expected LAND Project benefits. ISC should report publicly on the achievement of all planned benefits.

2.   **We recommend that Information Services Corporation should set measurable and verifiable LAND Project benefits and report publicly on the achievement of all planned benefits.**

Criterion 3 – LAND Project management practices and reports

We expected ISC to have good project management systems and practices to control the implementation of the LAND Project. Good project management practices involve the use of project teams with the necessary experience, skills, and leadership to manage the project. Good

project management practices include planning and reporting progress against the plan. The LAND Project team also needs to manage risk, ensure quality work, and communicate progress and successes. Good project management systems and practices help to ensure that deadlines are achieved, costs are contained, and needs are met.

We discuss our findings for this criterion under the following headings: risk management, scope management, project monitoring, communication management, and human resource management.

Risk management

Risk management includes processes to plan, identify, monitor, and respond to risks. Risk management includes a threat and risk analysis, establishing a plan to reduce key risks to an acceptable level, processes to monitor risks during the project, and reporting on responses to risk. We examined the processes ISC used to monitor and respond to risk leading up to and during the implementation in Moose Jaw.

ISC has taken steps to manage the risk associated with the LAND Project. ISC used a risk matrix that set out risks for each component of the LAND Project. The project team regularly reported to the LAND Project committees and subcommittees on risks. ISC reported on risk by describing the likelihood, severity (impact on the LAND Project), mitigation, and who was responsible for mitigation and further monitoring.

We conclude that the risk management processes used by ISC up to and including the implementation in Moose Jaw were adequate. Here are examples of how ISC managed risk:

♦ Integration risks – The LAND Project is large and complex. It was important to reduce the risk of work getting out of step between system development, business process development, legal and policy development, and organizational planning. The Integration Committee and the Project Steering Committee were responsible to mitigate this risk. This risk became critical in late 2000 and ISC reduced this risk by delaying the implementation of the project in Moose Jaw and later in Regina.

13

♦　　Contracting risks – The LAND Project is a complex project with a major contribution from an outside contractor. The contracts included off-ramps that gave ISC the right to cancel the contract for a given price at key times in the project. ISC separated the contract into multiple work orders. In addition, ISC reduced the complexity of the system by breaking it down into nine independent modules. ISC further reduced its risks by negotiating fixed-price contracts for major elements of the LAND Project. A fixed-price contract shifts some risk to the contractor. ISC hired outside consultants and used employees who were experienced in IT to ensure that the contractor delivered the expected products.

Scope management

Scope management involves processes to ensure that the project includes only the work required to make the project a success. It includes processes to define and control what is included in a project. Scope management includes planning the project, defining the needs, verifying the needs and managing changes to needs throughout the project. We examined the processes used by ISC to ensure that the LAND system includes only the work required up to and including the implementation in Moose Jaw.

ISC used the following processes to manage the scope of the project:

♦　　Planning – ISC developed a concept document, a stakeholder needs analysis, and a business case to plan the project to meet the defined needs, which included making the applications flexible enough to use for other purposes. ISC also prepared plans to: update the laws and policies to use electronic land titles; move, store, and convert the old paper documents; and to train employees and key outside users to use the automated LAND System.

♦　　Defining needs – ISC worked with its contractor to develop a detailed design document. This document detailed all the processes, computer screens, and reports needed in the system.

♦　　Verifying needs – ISC verified needs primarily with acceptance testing. Acceptance testing started with a testing plan. The plan

14

explained how to test and gave the acceptable error rates. ISC classified errors according to severity by application and for the overall system. It required all critical errors to be fixed before the system was implemented. The Implementation Committee regularly received testing statistics. ISC also ensured the policy and legal group were involved in testing to ensure its needs were met. Also, the external user community was kept involved through focus groups and training. ISC used the feedback to fix the system, improve implementation, and amend training. Also, ISC sampled titles from all districts to ensure that all types of transactions were analyzed in estimating the cost of conversion.

♦ Managing changes - ISC had a strong defect and change management process to track errors and scope changes, cost them, and track their progress to completion. ISC used a computer program to track and report on all defects or errors. The defect tracking system also tracked changes required to the system. ISC and the contractor developed a change process to resolve disputes and cost scope changes. All changes were tracked and priced to help ensure needs were met within budget.

As part of the conversion plan, ISC closed the Moose Jaw office for one week to move all paper to Regina and bring the Moose Jaw staff in for special training and to provide help with conversion. ISC created defined processes for the conversion of documents and title changes.

♦ ISC also used independent advisors to ensure that they were doing the right thing in key areas. They sought advice on: the technology used, the Project's readiness for e-commerce, its "commercial feasibility", its security, and its support for the new fee schedule. The advice varied, but primarily supported the project. Independent advice from experts is a valuable tool to ensure projects meet their objectives.

In conclusion, ISC used adequate scope management processes in the LAND Project. As the implementation moves from Moose Jaw into districts that are larger and more complex, like Regina, the Project's risks will change. It will be important for ISC to monitor whether the LAND System continues to meet stakeholder needs. It is also important, after

15

the LAND Project is complete, to document the lessons learned on this project. ISC should publish the results to help it and the rest of government to improve project management practices for future projects.

3.   **We recommend that Information Services Corporation should perform a post-implementation review of the LAND Project and make the results available to all government organizations.**

Project monitoring

During the course of a project, the project team needs to monitor how well it is managing costs, time, tasks, and deadlines, and take action when needed.

We examined ISC's processes to monitor and control costs. These processes closely link with scope management to ensure changes are costed and tracked. We examined the processes ISC used to monitor if the LAND Project was on time, tasks were completed, and deadlines were met.

The key to controlling time, tasks and deadlines of the LAND Project in the months prior to implementation in Moose Jaw was a weekly LAND Project Status Report and supporting documents. The LAND Project Status Report and its related documents tracked the status of: testing, procedural documentation, regulations, training, outstanding tasks, the GIS conversion, and the plan conversion. The LAND Project Status Report also tracked and classified significant LAND Project risk.

ISC had processes to track, on a monthly basis, the approved budget and the forecasted cost to complete. ISC also developed its budget and recorded the full cost of the LAND Project, including all staff costs. ISC used change requests to set out expected costs or savings related to proposed changes. It used this information to update its forecast to complete by key component of the LAND Project. The report also included the forecasted amount to be drawn from the contingency fund and other savings. However, the reports to senior management did not include a comparison of actual costs of the LAND Project to date to the budgeted cost of work completed. ISC stated that it has spent $38 million on the LAND Project to October 2001. It has forecasted that changes and

delays will use up its contingency fund by the end of the LAND Project. The changes and delays will make it a challenge for ISC to meet the budget of $58 million. An analysis comparing actual cost to the budgeted cost of work performed would give senior management an indication if the work completed is within budget and will help them assess if the forecasted cost to complete the LAND Project is reasonable.

We conclude that the processes to report the status of the Project's costs, time, deadlines met/passed and management action was adequate, except that ISC did not compare the actual costs to the budgeted cost of work completed, to ensure work completed is within budget.

4. **We recommend that Information Services Corporation should receive monthly reports on the comparison between actual costs to date on the LAND Project to the budget to date.**

Communication management

Communication management involves processes to ensure the timely and complete creation, movement, and storage of information on a project. It includes documenting the project's systems and processes, the project's history, its training, and stakeholder communication.

We examined ISC's management of internal and external communications for the project. We also looked for documentation of systems, user processes, and disaster recovery.

We found that documentation of meetings and decisions was comprehensive. There was monthly reporting to key committees on financial status, schedules, and project risk. ISC had appropriate systems to track changes to the system and system defects. We also observed that detailed flowcharts, outlining the conversion processes, were developed and posted. These charts helped the staff doing the conversion to understand the processes and carry out their individual tasks.

However, ISC did not have all the LAND System documentation in place before it implemented the LAND Project in Moose Jaw. For example, user manuals, technical descriptions of systems, security, and disaster recovery plans were not all documented and approved. It is important that

17

documentation is complete before developers and implementers start to leave and the knowledge is lost.

Due to the size and complexity of the system, it is important that a threat and risk assessment be done to help complete, test, and approve a business continuity plan. The business resumption plan will provide senior management and the users confidence that, in the event of a disaster, the LAND System will resume operations within an acceptable time.

We conclude that the processes used to ensure the timely and complete creation, movement, and storage of information on the LAND Project were adequate except for the completion, testing and approval of a business continuity plan before implementation of the LAND System in Moose Jaw.

5. **We recommend that Information Services Corporation should complete, test, and approve its business continuity plan.**

Human resource management

Human resource management involves processes to make the most effective use of the people involved in a project. ISC used processes to make the most effective use of people involved in a project by recruiting staff from Justice and SaskGeomatics to build a qualified team. ISC also trained some of its project staff to become project management professionals. ISC then filled the gaps with qualified people from the contractor or from other contractors. The project manager responsible for project status reports was a professional project manager, and a number of staff on the LAND Project were trained in project management practices.

With its different components and phases, the LAND Project required a unique organizational structure. ISC set up an organizational structure for the LAND Project that included the following components: legal/policy; system development; infrastructure and support; and human resources. ISC also established the e-business centre to manage the new LAND System in a separate location from the conversion centre, which converts titles and integrates them with electronic survey plans and the GIS.

18

ISC faced two main human resource challenges moving to the new LAND System. First, ISC would need significantly less staff to run the LAND System after its implementation. Second, the staff would require different skills and training than the staff required under the old system.

ISC managed these challenges by communicating with its staff and the union before the start of the LAND Project about the proposed changes and involving its staff and the union in planning for the changes. ISC reached an agreement with the union to staff key positions on the LAND Project team and the new LAND System with staff employed in Land Titles, Surveys and SaskGeomatics. ISC also used the Organizational Planning Committee, with representatives from all land title offices and from different levels of the organization, to help manage human resource challenges. Also, early in the LAND Project, ISC offered training to the Land titles staff in career planning, change management and computer skills.

We conclude that the human resource project management processes were adequate.

19

Selected resources

Boehm, B.A. (1989). *Tutorial: Software Risk Management*. Washington D.C.:IEEE Computer Society Press.

Fleming, Q.W. and Koppelman, J.M., (July 1998). *Earned Value Project Management: A Powerful Tool for Software Projects*, CROSSTALK: The Journal of Defense Software Engineering, p. 19-23.

Grady, R.B., (1997). *Successful Software Process Improvement*. Upper Saddle River, New Jersey: Prentice Hall PTR.

Humphrey, W.S. (1989). *Managing the Software Process*. Don Mills, Ontario: Addison Wesley Publishing Company Inc.

Information Systems Audit and Control Foundation IT Governance Institute (July 2000). *CobiT: Governance, Control and Audit for Information and Related Technology 3rd Edition*. Rolling Meadows, Illinois: Information Systems Audit and Control Foundation.

Project Management Institute. PMI Standards Committee (1996). *A Guide to the Project Management Body of Knowledge*. Pmbok Guide. Upper Darby, Pennsylvania: Project Management Institute.

Treasury Board Canada, Chief Information Officer Branch, Project Management Office. (May 1996) *An Enhanced Framework for the Management of Information Technology Projects*.

Treasury Board Canada, Chief Information Officer Branch, Project Management Office. (February 1998). *Creating and Using a Business Case for Information Technology Projects*.

United States. Department of Defense (April 1997). *The Program Manager's Guide to Software Acquisition Best Practices: Version 2.0.* Arlington, Virginia: Software Program Managers Network.