



CPRN DISCUSSION PAPER

Aeronautical and Technical Services – Natural Resources Canada

By

Joseph Peters

&

Katie Davidman

Work Network – Canadian Policy Research Networks

December 1999

Human Resources in Government Series
CPRN Discussion Paper No. W|08



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Foreword

Governments in Canada have undergone a period of unprecedented change throughout the 1990s. External pressures and the need for fiscal restraint have led them to reevaluate their services to the public and reduce the size of their workforces. This widespread restructuring has had tremendous human resource implications for governments, public sector unions, and for employees.

However, there was no clear understanding of the nature and magnitude of the changes that were affecting government work and workers at the workplace level. To fill this information gap, CPRN initiated a large-scale project on Human Resource Issues in Government. Launched in early 1997, this project was based on a research design that was jointly developed by Gordon Betcherman, Network Director at that time, and Anil Verma of the University of Toronto. The overriding goal of this Project is to generate new applied knowledge that will help the federal and provincial governments and civil service unions redefine the strategies, policies, and procedures needed to transform the public service. The Project is based on the belief that this transformation must include the development of both efficient and innovative workplaces and a healthy, motivated, and skilled workforce.

The research is guided by a Project Advisory Committee that includes representatives of the sponsoring organizations as well as experts in the field. The sponsoring organizations include three federal agencies (Human Resources Development Canada, the Public Service Commission, and Treasury Board Secretariat), four provincial governments (Nova Scotia, Ontario, Manitoba, and Alberta) and the Public Service Alliance of Canada.

The research is organized into a number of key research areas. The first group of studies sets the context for the overall project by describing how the environment shaping human resources in government is changing. They provide a statistical profile of employment trends¹, an analysis of trends in labour-management relations², and a comparative analysis of public-private compensation trends.

The next set of studies is based on two large-scale surveys, one of managers responsible for units of between 5 and 100 people and the other of government union representatives. Reports on these surveys will address technological change in the workplace,

¹ Peters, Joe, *An Era of Change: Government Employment Trends in the 1980s and 1990s*. Human Resources in Government Series. CPRN Study No.[03] (Ottawa: Canadian Policy Research Networks, 1999). Also see Work Network Research Highlights -- An Era of Change, No. 1, Spring 1999.

² See Swimmer, Gene (ed.) (forthcoming, OUP Press), *Public Sector Labour Relations in an Era of Restraint and Restructuring*. Also see Work Network Research Highlights Number 2, Summer 1999 – The 1990s: A Turbulent Decade for Labour Relations in the Public Service.



organizational change and human resource management innovation, flexible work arrangements, and industrial relations issues.³

Surveys such as these are extremely valuable in providing information on trends and patterns in a large number of workplaces. However, in order to illuminate the actual process of change, how it is implemented, and its effects, we looked in more detail at specific workplaces, conducting four case studies.⁴ The case studies serve as illustrations of the kinds of changes that are taking place in government workplaces – changes that clearly have significant implications for how government employees do their work and for how they are managed. Case studies such as these can be useful in identifying lessons learned and can help to inform the workplace change process across government. On behalf of CPRN, I wish to extend my sincere thanks to the many individuals who contributed their time to the case studies. The insights they provided were invaluable in helping to make the change process come alive. I also wish to thank the authors of the four case study reports for working to provide these real-life stories of transformation in government. In examining these changes in more detail, we hope that other units in government can not only profit from the experiences we have documented, but also can see that change is possible, although not always easy.

Graham Lowe
Director, Work Network

November, 1999

³ The remaining studies and discussion papers in the Human Resources in Government Series will become available throughout the year 2000.

⁴ Lonti, Zsuzanna, “Restructuring the Corporate Function in Government – A Case Study of the Integrated Justice Corporate Services Division in Ontario,” Human Resources in Government Series, CPRN Discussion Paper W/06; Lonti, Zsuzanna, “Industry Self-Management as a Strategy for Restructuring Government: The Case of Consumer and Commercial Relations (MCCR) and the Technical Standards and Safety Authority (TSSA) in Ontario,” Human Resources in Government Series, CPRN Discussion Paper No. W/07; Peters, Joseph and Katie Davidman, “Aeronautical and Technical Services – Natural Resources Canada,” Human Resources in Government Series, CPRN Discussion Paper No. W/08; and Rastin, Sandra “Outsourcing of the Engineering Design Process in the Alberta Transportation and Utilities Department,” Human Resources in Government Series, CPRN Discussion Paper No. W/09.



Introduction

Aeronautical and Technical Services (ATS) is a government workplace that today looks dramatically different than it did a decade ago. ATS has undergone significant organizational change in the form of downsizing, restructuring, and the adoption of a new orientation and mandate. Further, ATS has over the past several years adopted a number of significant operational changes to improve quality, client service, and organizational performance. These changes include ISO 9001 registration, activity-based costing (ABC), and the National Quality Institute's Fitness Test. In addition, technological change continuously transforms the way in which many people at ATS do their jobs. It is this multi-faceted change, and the signs of a workplace striving to be cutting edge, that positioned ATS as an excellent candidate for this case study.

The purpose of this case study is to tell the story of these changes at ATS, focussing mostly on the changes that have occurred in the last three years. It is important to note that these changes have taken place in the context of substantial departmental and governmental downsizing and restructuring. The bulk of this report describes changes divided under two broad headings. *Organizational change* refers to macro changes such as restructuring and downsizing that set the context for the adoption of new *operational practices* within ATS. Operational changes include the adoption of new quality standards, budgeting practices, and technologies.

We begin first with a brief description of our case study methodology, followed by an introduction to ATS.

Methodology

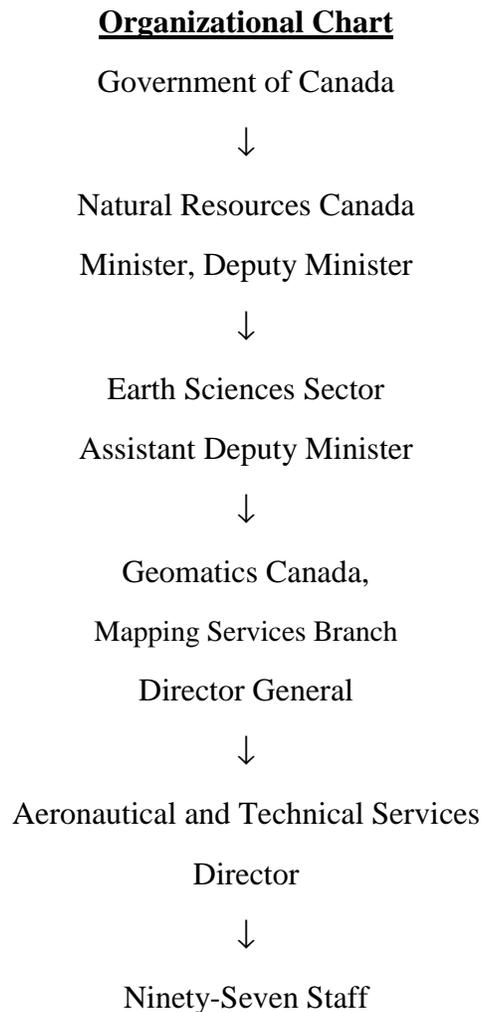
Information for this case study was derived largely from a series of key informant interviews at ATS. Interviews were conducted in the winter of 1998 with the Director General of the Mapping Services Branch, the Director of Aeronautical and Technical Services, the Manager of the Quality Management System, and five employees. A more detailed description of the people interviewed for this case study is presented in Appendix 1.

To supplement what we learned from interviews, we reviewed relevant published and unpublished documents. These included annual reviews and reports from various levels within the department, organizational charts, several internal studies and material on the ATS web page. The Director of ATS also filled out the *Survey of Workplace Issues in Government* associated with the Canadian Policy Research Networks Human Resources in Government Project, which provided information on human resources at ATS.



Aeronautical and Technical Services - ATS

Figure 1: Aeronautical and Technical Services (ATS)



ATS Functions

Aeronautical and Technical Services (ATS) is responsible for publishing thousands of aeronautical charts per year on an internationally synchronized 56-day cycle. These maps are used by air traffic controllers, civil and military flight pilots, and commercial and government planners. They ensure safe navigation in Canadian airspace, and are used for flight planning, pilot training, air traffic control, search and rescue, military



operations, and recreational aviation. Charts are updated every 56 days if necessary to reflect changes that have been made to airways, navigational aids, airport runways, flight-paths, or air traffic control facilities. On average approximately 130 charts and publications (publications can contain hundreds of charts) are changed during each 56-day cycle. The safety of the Canadian navigational system is at stake, so an important source of pride within ATS is the quality of their work.

ATS also plays a role in the case of Canadian crises. For example, during the 1997 Manitoba floods and the 1998 Central and Eastern Canadian ice storm, employees and managers at ATS worked around the clock to print precise maps for emergency workers. ATS also provides specialized cartographic imaging and printing services to other Government of Canada agencies.

Products at ATS

A number of complete aeronautical products are produced by ATS, including: Instrument Flight Rules (IFR) Charts, Visual Flight Rules (VFR) Charts, the Canada Flight Supplement (CFS), The Canada Air Pilot (CAP), Water Aerodrome Supplement, Designated Airspace Handbook, and a number of other planning and plotting charts.

Budget

ATS is currently working within an annual budget of about 14 million dollars, allocated between the three main areas of operation within ATS (See Figure 2). Current budgeting practices at ATS are fundamentally different than they were several years ago, as will be described later, in that they now operate largely on a revenue-generating basis (a revolving fund).



Figure 2: ATS Budget⁵

	Chart Services	Imaging	Printing	ATS Total 1998	ATS Total 1994
(\$ million)					
Revolving fund*	6.0	2.0	3.0	11.0	2.6
A-Base**	1.5	1.5	-	3.0	7.5
Total	7.5	3.5	3.0	14.0	10.1

* A revolving fund is a cost-recovery mechanism allowing costs to be paid from revenues.

** Appropriation Base (A-Base) funds are the monies allocated to the unit by the department.

Employment at ATS

Ninety-seven people work at ATS, the majority of whom are technical workers. Work within ATS is currently divided into three quite separate areas: aeronautical chart services, cartographic imaging, and printing. Workers within the three areas are dependent on one another to meet the deadline of each 56-day cycle (for aeronautical products). Of the 97 employees, 52 people work in charts services, 32 in imaging, and 13 in the printing area. Figure 3 presents a more detailed breakdown of employment in these three areas. For a description of each of these work areas, see Appendix 2.

Figure 3: Vital Statistics: Employment at ATS

	Director	Scientific/Profess.		Technical		Clerical		Operational		Total	
		Non-mgmt.	Mgmt.	Non-mgmt.	Mgmt.	Non-mgmt.	Mgmt.	Non-mgmt.	Mgmt.	Non-mgmt.	Mgmt.
Charts Services	1	11	2	33	2	1		2		47	5
Imaging		5	2	20				5		30	2
Printing								12	1	12	1
Total ATS	1	16	4	53	2	1		19	1	89	8

⁵ These figures are approximate, as described to us by a manager in an interview.



Figure 4: Vital Statistics: Working Arrangements at ATS

Employment Status		Work Arrangements	
Permanent, Full-time	83	Shift Work	11
Permanent, Part-time	1	Job Sharing	0
Long Term Contract (> 6 months)	10	Flextime	97
Short Term, Temporary, Contract, Seasonal, On-Call, Casual	3	Compressed workweek	60
Temporary Agency	0	Work at home, telecommuting	0
Total	97	Phased-in retirement	0

Figure 4 shows the employment status and working arrangements of employees at ATS. Most people at ATS have permanent, full-time jobs. Engineers are more likely to be working on contract (not shown), in part because of high turn-over among engineers, and in part because engineers tend to be accessed through programs such as the Geomatics Professional Development Program, which places engineers for 6 month assignments.

At ATS, all employees have access to flexible worktime and a compressed workweek, which are popular policies being accessed by the majority of workers in the unit.

ATS is facing the demographic challenges common to many government workplaces. About 80 per cent of managers and 50 percent of employees could retire in the next five to six years. A challenge for ATS over the next few years will be to manage the turnover and loss of experience as these employees leave, at the same time as managing renewal as new employees are hired. Currently, this demographic composition combined with the lean organizational structure mean that, like many other government workplaces, there is very little room to offer promotions. One employee noted that that was a source of frustration among young workers.

Organizational Change at ATS

Government Restructuring and Downsizing

New Structure and Services

A number of elements of government-wide restructuring have impacted ATS. In the early 1990s, Aeronautical Charts simply provided charting services, and the two remaining functions of ATS, imaging and printing, were in separate areas of the government. In 1995 Aeronautical and Technical Services was formed out of Aeronautical Charts, Imaging and the Canada Map Office (CMO). In 1996, the CMO,



the retailing and distribution functions for government maps and charts was moved out. In 1997, the printing function was brought into ATS. The ATS of today reflects the three operations, charting, imaging, and printing, all rolled into one unit.

The printing function, in particular, went through a number of transformations on its journey that finally ended at ATS. In the early 1990s, government chart printing was spun out from government to the more business-oriented Canada Communications Group (CCG). A worker who followed his job through this transition noted that he found it quite stressful. Several years later, this function was brought back within the government when it was realized that it would be more beneficial to keep this unique service in-house.

In addition to this change, there was also a period of time where managers and employees now at ATS were expecting to lose their status as core government employees and become a Special Operating Agency with the rest of Geomatics Canada. The plans for this were however reversed at the last minute, because it was determined that the use of a revolving fund would allow workplaces within Geomatics Canada to achieve the required flexibilities and authorities.

A New Relationship with a Major Client

One of the most significant changes for ATS as a result of government-wide restructuring was the decision, over 1995-1996, to turn the Canadian Air Navigation System (ANS) of Transport Canada into a private, not-for-profit organization called Nav Canada. This had a big impact on ATS, since the ANS had been one of their largest clients. The relationship between ATS and Nav Can was permitted to continue in the form of a five-year exclusive contract; however, a manager reported that the chemistry between the two organizations changed, becoming much more business-like. The new five-year contract is seen as a “test” in which Nav Canada will decide whether to use ATS as a supplier in the future. This has placed ATS on a competitive footing with equivalent service providers in the United States.

Downsizing

In the context of these organizational changes, Aeronautical Charts downsized over the last 10 years from over 100 employees to about 55 in 1995-96. Some of the downsizing occurred due to the introduction of new technology in aeronautical charting, and some was due to government downsizing, which was achieved largely through attrition. The numbers at ATS have since come back up to 97, in part because the imaging units and the printing service joined, and in part because ATS has been hiring new employees needed to allow the unit to meet its production requirements.



A New Orientation for ATS

Like most government workplaces, ATS was profoundly affected by Program Review. ATS lost about 55% of its budget as a result. This, combined with the need to do business with the newly privatized Nav Canada, formed the catalyst for ATS to re-visit its mandate.

At the time, ATS was producing maps “of every nook and cranny” of Canadian airspace, with the aim of securing public safety by preventing any potential air accidents. In the reorientation, it was decided that maps would be created only if they were in significant demand from pilots, based on the assumption that pilot demand is the best proxy for safety. Under this new client-driven mandate, hundreds of titles were cut, although special custom runs can be made for discontinued items. The current mission statement at ATS reflects the shift from a “public” focus to a “customer” focus:

“As Canada’s leading supplier of aeronautical information, the Aeronautical and Technical Services group is committed to providing the highest quality products and services to its customers.”

Workplace Impact

Employees currently at ATS have been through a lot of organizational change in the 1990s, and the impacts of these changes are still being felt. As is probably common to many government workplaces, employees are generally still recovering from the downsizing and restructuring. In particular, they are frustrated by the fact that all this change continues to be accompanied by both increased workloads and a pay freeze.

Most people we interviewed continue to perform several responsibilities and report that most functions at ATS are performed without any human resources to spare. One employee guessed that he was doing 40 percent more work now than he was three years ago. In the printing press area, the remaining twelve employees (down from about 24) regularly work (paid) overtime in order to get all of their work done.

The significance of Nav Can as a client to ATS puts a lot of pressure on management and employees at ATS to strive towards ensuring that the contract will be renewed. This pressure serves as a continuing catalyst for ATS to be a high quality, cost-effective organization. However it is also a source of some anxiety for employees and managers.

In the wake of this downsizing, there seems to be a real need among employees for more young people to be hired, to help rejuvenate the organization. Yet, ATS is a workplace that due to demographics, and in the interests of remaining lean, has little room for promotions. This results in somewhat of a deadlock situation with regard to staffing.

Employees generally characterized morale at ATS as being low, and as having declined in the last several years. On the other hand, morale at the management level seems to be



relatively good. Managers at ATS seem to have benefited from some of the changes, such as increased autonomy resulting from the relaxing of rules by Treasury Board.

The restructuring, downsizing, and reorientation that has affected ATS over the last several years has been one of the catalysts for the implementation of a series of operational changes. It is to these changes that we now turn.

Operational Changes

Introduction

There have been fundamental operational changes that have been implemented at ATS over the past several years. These changes have been driven not only by departmental and organizational mandates, but by forces within the charting industry and rapid technological advancements. There have been three key areas under which the major operational changes can be categorized.

Technological change is the first key area that is investigated. ATS has been involved in a massive transition from conventional (photo-mechanical) to digital (computer produced) maps.

The second key area, involving quality initiatives, has two components. The first lies in the implementation of ISO 9000, an international quality management system; the second is the participation in the National Quality Institute's (NQI) quality organization assessments (Fitness Test).

The final area of note lies in innovative financial management in two key activities. These involve the use of a Revolving Fund a revenue-generated fund (versus the traditional Appropriation Based Fund or A-Base), and the implementation of Activity Based Costing (ABC), an accounting technique that facilitates more accurate pricing.

Technological Initiatives

Map making, traditionally, was performed by hand. Draftpersons would etch out maps backwards (in reverse order) into copper plates. Those plates would be used for either a single map or a layer of a map during the printing process. A map could contain multiple layers that would distinguish between colours. In many cases, changes or updates to a map would necessitate the creation of new plates.

After the Second World War this plate production evolved into drawings done with specialized photomechanical materials which were converted to printing film for each layer that was necessary. The most recent technological transformation involves a shift from film to digital technology. Digital technology involves computer-based imaging. A



combination of these two technologies is employed today, with a continuing evolution to full digital production.

This transformation started in charting and moved what was formerly referred to as the pre-press operation in ATS to what is now referred to as imaging. The technology had been available for some time; however it was not until the early 1990s that the digital process became a standard in charting and imaging, which was cost efficient, and adaptable to the unique ATS environment.

Workplace Impact

This technological change had a tremendous impact on the ATS workforce. Many employees had spent 20 to 30 years using the traditional or conventional method of map making. Employees expressed that there was a lot of resistance to change in the conversion to digital technology, which was magnified with the older and more experienced workers who regarded themselves as highly skilled craftspersons.

The widespread introduction of the digital process within ATS coincided with the downsizing that took place. Early retirement programs and incentives allowed this technology to be implemented without a complete reskilling of the ATS workforce. What was lost, as a result, was a tremendous amount of institutional memory, which has not been completely recovered to date.

Retraining was necessary, in conjunction with the hiring of new employees. There was some discussion surrounding the impetus for training within ATS and Mapping Services as a whole. As will be discussed in the NQI assessment, employees and management generally agree that training occurs more on a project-need basis versus training for a career. The conversion to digital technology from conventional is one instance where the lines between these two perspectives are somewhat blurred.

Quality Initiatives

Quality has always been an important issue and part of the work done at ATS and NRCan in general. The Assistant Deputy Minister (ADM), Earth Sciences Sector (ESS) responsible for Mapping Services has a Quality Advisor who tracks and reports on quality within the division. The need for quality at ATS is heightened by the fact that their aeronautical charts play a role in the safety of air traffic in Canada.

Two key quality initiatives that have had a major impact at ATS were examined. The first is ISO 9000, which was investigated and implemented in ATS to ensure a quality process is used throughout the map making process. The second area falls under National Quality Institute (NQI) assessments which have been used to check how Mapping Services (ATS falls under this umbrella) has moved to become a quality organization.



ISO 9000

ISO 9000 is an internationally recognized system of standardization for quality management and quality assurance. This standard was started in Europe and has quickly become a necessity for European manufacturing firms as well as foreign firms wishing to do business with them. This standard has more recently gained prominence in the North American context.

ATS first discussed the potential use of ISO 9000 in the early 1990s. The International Civil Aviation Organization (ICAO) is an international organization which sets global standards and requirements for air navigation and safety. Once it became clear that ICAO was investigating the possibility of ISO 9000 becoming an operating requirement, ATS adopted the view that it was prudent for ATS to give ISO 9000 a good look.

How ISO 9000 Works

ISO 9000 involves two key concepts:

- Documentation of important operational and management processes that affect quality;
- Auditing of the organization, through internal and external audits, to ensure quality processes are followed.

The Manager of Quality succinctly summarized what ISO 9000 is:

“ISO is not just documentation. It is good management too. At its best it is good, fact-based management. It can be summarized as follows: say what you do, do what you say, report on what you did, and improve the process.”

ATS took their existing quality processes and ensured they complied with the ISO 9000 standard. Their operational processes were not fundamentally changed, but they became thoroughly understood, documented and known to employees.

Process of Implementation

There were six internal steps that were embarked upon in implementing the ISO 9000 process at ATS. The first section of ATS to undergo ISO 9000 registration was aeronautical charting.

Throughout these six stages the management at ATS emphasized the importance of the ISO consultant. ATS hired an external consultant to help them through each stage, which is a common undertaking by firms implementing the ISO 9000 standard. The Manager of Quality for ATS stated that he felt that their particular consultant was outstanding, and provided important guidance and assistance throughout the entire process.



In 1994, the first step for ATS was when management became aware of the need for a quality management system. The discussions by the International Civil Aviation Organization (ICAO) as well as other international aeronautical data handling standards regarding ISO 9000 persuaded management at ATS to investigate the feasibility of the system at ATS.

The second step was to perform an ISO 9000 Gap Analysis with an experienced consultant. Once the gap analysis was reviewed, the decision to proceed was made.

The third stage was the formation of a quality council. There are up to thirteen individuals on the council who represent the different functional areas of ATS, as well, there were divergent opinions on the benefits of ISO 9000. This was viewed by management as being an essential part of the process of getting the most out of the quality council and obtaining buy-in from employees at the same time. Many of the members of the quality council were sponsors or co-sponsors for the Quality Assurance Procedures that form the second tier of the ISO documentation pyramid (See Appendix 3).

The fourth stage involved training and development. Key members of management, including the quality manager as well as the Director of ATS, had already been involved in training programs. This was necessary to start the process. However, it was at this stage where all employees from ATS received a half-day seminar on ISO 9000, to help explain the standard, how they would benefit and what would be required of them. This helped relieve some confusion and misconceptions about the process. However, a number of employees remained skeptical and noted that many believed that it was just another management fad, even after the training.

The fifth stage was the development of the documentation system, required to meet ISO standards. This entailed the identification of the processes as well as the structuring and drafting a documentation standard. This stage in the implementation process was the most time consuming. Because documentation is the key to ISO 9000, a more detailed depiction of how the system works is provided in Appendix 3.

The next stage included the selection of a registrar and the internal auditing team. The internal audit team perform audits on different areas of ATS and on different elements of the ATS quality management system, to see if the processes are being followed, and if they comply with the system. Problem areas can be identified and addressed to ensure that the quality process is maintained. The auditors are trained on how to conduct internal audits. Internal audits an important element of the ISO 9000 system.

The final step towards registration to ISO 9000 is the external audit. The external audit is performed by a registrar, of which there are many to chose from in Canada. There are distinctions between the various registrars in terms of expertise, international recognition, etc. ATS chose a registrar that was recognized within North America and Europe, which suits their customer requirements. Before the assessment is performed by the registrar,



the usual practice is for the external consultant to perform a final pre-assessment before the registrar arrives. This is to ensure that there are no glaring areas of non-compliance. There can be substantial delays in the registration process if the registrar finds any major problem areas during their assessment. ATS's assessment went smoothly and in June 1997 they were officially ISO 9001 registered.

Cartographic Printing joined ATS in April 1997 and was included in an expansion of the scope of the registration in February 1998. The rest of ATS, as well as Cartographic Imaging was included within the scope of the quality management system in December 1998.

Workplace Impact

While ISO 9000 has had an impact on all employees at ATS, it has been to varying degrees. In many ways because quality was already instilled in ATS production practices, employees might perform the same tasks in the same way, but may document their activities differently. However, for members of the Quality Council and internal auditors, ISO 9000 brought about added responsibilities and commitments, which benefit the organization.

Employees consistently expressed that ISO 9000 helped to organize what they do on a daily basis. Several noted that because each person's job is documented, if someone is away or leaves ATS, it is possible to refer to the ATS documentation to find out what that person did. This is an important point as many employees felt that with the downsizing there was a tremendous loss of organizational memory as people took their experiences and procedures with them. With ISO 9000, a manager or new employee might not know how to perform each of the tasks a departed employee was responsible for, but at least they would know what the tasks were.

There was some resistance to the ISO 9000 process; however, it was noted that it was no more than the normal resistance to change. One employee referred to ISO 9000 as an "added pain" with all the procedures and documentation; however that individual also felt that employees would "scream" if ISO 9000 was taken away from them now. In this sense, ISO 9000 has become an essential tool for both employees and management.

Employees generally stated that ISO 9000 has not had a tremendous impact on morale in either direction. Management on the other hand felt that the ISO 9000 implementation actually improved morale as it gave employees a sense of accomplishment and something of which to be proud.

When the employees were asked who benefits from ISO 9000, there was a mixed response of customers, employees, and management. Most likely, it is a combination of the three.



Key HR Issues

There were myriad human resource issues that ATS had to address in the transition to ISO 9000. There are three key areas that warrant additional comment: training, internal communication, and employee feedback.

Training played a key part in the implementation of the ISO 9000 standard at ATS, for both management and employees. Management was involved in ISO 9000 training sessions from the early, investigative periods of the implementation process. One manager noted that he took the same course twice because he found it so informative and important to performing his role in the process. Employees also participated in training in the early stages of the implementation. These sessions facilitated the implementation process, as employees had the opportunity to have the critical questions answered on what ISO 9000 was, and why this system was being implemented at ATS. Training for internal auditors was also extremely important in the final stages of the implementation for their involvement in the maintenance of the system after registration. All in all, training was an essential factor in making ISO 9000 a reality at ATS.

There are two types of communications that were involved to some degree in the ISO 9000 implementation process: one way and two way. One-way communications characterizes the messages that were sent from management to employees. This was typically in the form of newsletters or posted messages. Two-way communications in terms of formalized discussions between management and employees, while less frequent during the ISO 9000 implementation, were scheduled as an important part of the process. The training process was, on a broad scale, the sole means of formalized dialogue for employees. The Quality Council was the other vehicle for two-way dialogue, but this was limited in scope of participation, although summaries of all ATS Quality Council meetings were made available to all employees. In retrospect, management feels that communications between management and employees could have “been better.” Employees supported this opinion as it was stated that they “were not always sure what was going on” throughout the process.

ISO 9000 instituted a process by which employee feedback must be recognized and dealt with in a formalized manner. ISO 9000 has led to a new means of two-way communications. Employee comments and suggestions must each be dealt with in a timely manner. This includes both a decision on whether or not to act on a suggestion or comment, as well as the reasoning or explanation behind it. This could be considered one of the means of improving two-way communications between management and employees. Employees mentioned that the feedback mechanism in ISO 9000 was a positive development, and this was also noted in the documentation from the National Quality Institute (NQI) assessments.



Final Comments

During discussions with management, they stated that by choosing ISO 9000, they did not have to “reinvent the wheel.” ATS needed a new, comprehensive and consistent quality management system, and ISO 9000 provided the solution. ISO 9000 has also provided ATS with a valuable marketing tool to prospective and existing clients by confirming their commitment to quality. Employees seem to have embraced the process, not without some resentment, but now find ISO 9000 a valuable tool in their workplace.

National Quality Institute – NQI Assessment

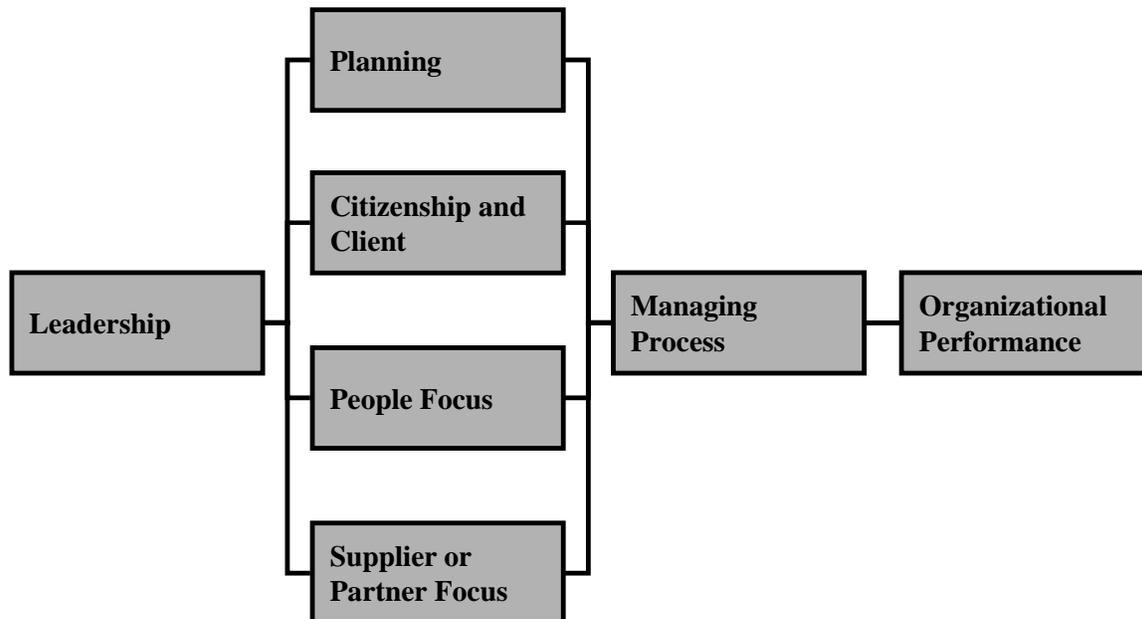
Description

The National Quality Institute (NQI) assessment is the second area of quality initiatives that ATS has been involved with over the past several years. The NQI was established in 1992 with a mandate to help Canadian organizations from all sectors understand how to utilize total quality principles. The assessment provides an institutional framework for assessing a holistic approach to quality. Although it was stated by management that this covers more of the “touchy-feely” organizational issues, an evaluation of the NQI Assessment components reveals that there is much more to it.

This assessment is not performed solely within ATS, but in Mapping Services, of which ATS is a part. There are seven key components of the NQI Assessment; leadership, planning, citizenship and client, people focus, supplier/partner focus, managing process, and organizational performance (seen in Figure 5). Through the use of focus groups, a consultant runs through the assessment structure identifying strengths and weaknesses in Mapping Services performance in each of these areas. From this assessment, there are a variety of issues that are brought forward. Mapping Services sets aside what it considers “the vital few” which are to be action items for the next year.



Figure 5: National Quality Institute Criteria



Workplace Impact

The NQI assessment has had an impact on the workplace, but the extent of that impact is not clear to either employees or to management. The assessment report from 1998 made a point that was echoed by the employees we spoke to:

“Most people perceive that the 1997 NQI assessment did not result in any action relevant to them: the actions taken have not been well communicated, and when they are visible, they are not seen to be linked to the assessment.”

Employees that we spoke to did not know what the NQI assessment was, even though some were members of the quality council. However when a specific example of one of the vital few results was explained, for example the reinstatement of the EG4 job classification, they recognized the change but did not know that this was a result of the NQI assessment.

During our discussions it was stated that the NQI assessment was a priority for management; however the 1998 results revealed that many of “the vital few” from 1997 had not been acted upon. One manager did note that he felt that the NQI assessment had not been totally successful because they did not move fast enough on the issues. The vital few for 1998 are: recognition, leadership effectiveness, communication of strategic direction, classification, and training and career development.



HR Issues

The NQI assessment is an excellent tool for the identification of gaps within the organization, especially in relation to human resource issues. There are several examples from the 1998 assessment that are worth noting.

In the area of training, it was noted that there is not a formal training profile available for employees to know what skills exist within the organization and what gaps need to be filled. The report also revealed that training is performed mainly on an ad hoc basis and not on a career planning fashion. This area is one of the “vital few” listed above for action in 1998/99.

One member of the management team stated that they felt that the NQI assessment was a morale booster for employees. This manager felt that the NQI focus-group style of assessment was an example of employee participation in the decision-making process as well as a reflection of the fact that the hierarchical nature of government is being replaced by a more flat structure. Employees, on the other hand, did not state that they felt that the NQI assessment affected morale in either a positive or negative manner. This could, however, be more a function of timing, i.e., the fact that the communications of the 1998 assessment report was presented in May of 1998, and our discussions took place in December of that year.

Financial Initiatives

There are two key financial initiatives that have been recently implemented at ATS. The first is the use of a revolving fund, and the second is the use of Activity Based Costing (ABC). The use of ABC at ATS was a test case and a unique endeavor in Natural Resources Canada. While the use of revolving funds in government is not unique to ATS, the use of this fund in conjunction with these other operational initiatives adds to the innovative environment of ATS.

Revolving Fund -- Description

The revolving fund is defined as a fund generated by operations. In private sector “speak,” this would be referred to as revenues. The use of revolving funds, as previously mentioned is not unique to ATS, but is far from the norm in government. Most departmental units use Appropriation Base (A-Base) funds. A-Base is the fund that is allocated to the unit, and they must determine how to spend based on various criteria and needs.

Utilization and Workplace Impact

ATS presently utilizes a combination of revolving funds and A-Base, but is moving towards full application of the revolving funds. Printing operations within ATS is



currently supported 100% through the revolving fund, while imaging is split between A-Base and the revolving fund.

The use of the revolving fund at ATS has resulted in a variety of workplace changes and impacts. The first step in moving to the revolving fund was a complete rationalization of the services that ATS provides. This was not performed solely on the basis of switching to a revolving fund, but was an integral part of program review. ATS no longer makes maps for the sake of making maps, but rather makes decisions on maps based on demand. It is still possible for custom maps to be made up on a cost recovery basis for those who wish to order a map that is no longer in mass production. This rationalization allows the revolving fund not to be overrun with heavy costs associated with low volume print runs.

The use of revolving funds affords ATS more flexibility in fund allocation than with A-Base. ATS has been able to increase its person years (PYs) with its revolving fund, which may not have been possible on a 100% A-Base fund basis.

Activity Based Costing

ATS was experiencing difficulty in costing its products to its clients. Prices might have been over or underpriced, but for the most part, it was assumed that overcharging was the norm. In the ATS Activity Based Costing Study, the following principle on the role of costing within government was outlined:

“As there is a need to recover costs, but not to generate undue profits, information on costs is required by management ...”

It was determined that Activity Based Costing could be the vehicle for providing ATS with a more accurate means of costing maps to clients. The use of the revolving fund was also considered another area that was pushing the need for more accurate costing. ATS was considered a test for the department in the use of ABC.

Description

Activity Based Costing (ABC) can be described as a financial accounting tool, whereby products can be more accurately costed, based on the inputs and utilization of resources required in their production. ABC is not only useful in costing products, but many proponents claim that ABC is the first step to Activity Based Management, where ABC can provide useful data on performance.

Although a detailed description of how ABC works in general and at ATS is beyond the scope of this case study, a simple example might be helpful in understanding some of the fundamental benefits of the system.

Traditionally the allocation of cost to a product might follow a process like the following:

- A machine may cost \$1000 to operate per week with two runs.



- There are 50 products produced per week on the machine.
- Cost of machine use per product is \$20 ($\$1000/50$).

With Activity Based Costing the following process may be undertaken.

- Machine runs twice per week at \$500 ($\1000).
- One run of 10 Map A.
- One run of 40 Map B.
- Map A Cost per unit is \$50 ($\$500/10$).
- Map B Cost per unit is \$12.50 ($\$500/40$).

In the traditional method, Map B would subsidize the more inefficient run of Map A where \$20 is added to the price of each map based on the use of this machine. ABC charges different rates to each based on utilization: \$50 for Map A and \$12.50 for Map B. The underlying factor to emphasize is that the same \$1000 is being allocated based on utilization, but it is no more or less than \$1000.

This is a basic example of ABC, but this becomes much more complex when all of the costing variables are included. This becomes magnified as, in many cases, the detailed information needed may not be available.

Process of Implementation

In January of 1997, the first ABC Costing Study was undertaken at ATS in printing. Finance employees in Natural Resources Canada performed this 3-month initiative. This allowed accurate rates to be performed for costing printing jobs. Once this was completed, a new nine-month study was started in Imaging. This was much more complex as there are many unique and independent functions in Imaging. This was completed in March of 1998. One of the key issues for management is that these results must still be reconciled (reconverted) for the existing financial management system. It is hoped that this will no longer be the case when all of ATS is put onto an ABC system.

Workplace Impact

ABC essentially has been a management tool to date and is not completely visible to employees. It has helped in make numerous purchasing decisions, based on whether or not the utilization of the resources warrants its purchase. The information on resource utilization, process efficiency and product-line cost recovery will be shared with employees to help guide them in continuous improvement.



Union Relations at ATS

Most people we interviewed, despite probing, had very little to say about union involvement at ATS, and we consequently have very little information with which to construct this picture. Part of the reason that we were able to obtain so little information on unions at ATS was that the union representative had recently left, and had not been replaced. Further, management at ATS does not meet with unions on a regular basis; rather they set up a meeting only if there is a problem. Management however reported that there have been many fewer grievances in ATS over the last several years compared to previously.

Virtually all employees at ATS are represented by either PSAC, the Graphic Arts Union, or PIPS. Some unions are currently in negotiations with the government. If there is a strike, there are some parts of ATS which are considered emergency or essential services. This means that when some ATS employees are on the picket line, some of their colleagues must cross this line in order to continue working towards the completion of the 56 day cycle of chart production. This can sometimes lead to uncomfortable dynamics between colleagues, as well as create extra work for remaining employees.

The workers in the printing area who have been there since the beginning of this decade have perhaps been through some of the greatest change with their union. When these workers were spun out to the Canada Communications Group in the early 1990s their union became decertified. The union regained certification when the press was returned to government again, and the Graphic Arts union now represents the press workers. This union was involved in the negotiations for more flexible working hours – there are now nine longer shifts per pay period instead of ten shorter ones. This allows ATS to keep the machinery running more regularly which creates cost-savings.

Observations

A New Government Workplace

It has been suggested that ATS has been a pioneer in the Federal Government with the changes to the workplace that have been undertaken over the past three to five years. ATS may be more appropriately categorized as a workplace with a desire to be on the leading edge. ATS created a smaller, faster, and more adaptive environment in which to operate. There is a greater sense of flexibility in decision making as a result of the use of revolving funds, and a new emphasis on cost recovery. Planning and foresight now seems to be promoted versus reactive or ad-hoc decision making. There also seems to be a new focus on customer needs.

When all of these factors are taken into account it seems clear that ATS is indeed a different type of government workplace. It might even be said that ATS is an example of



government becoming more business-like. Our interviewees prefer any reference to this evolution to be categorized as government adopting and adapting private sector practices to the public sector. Semantics aside, ATS is a new type of government workplace with more similarities to business than not, with concrete examples such as the ISO 9000 implementation and the use of Activity Based Costing.

Continuous Change

Change has always been a factor at ATS and will continue to be so. The factors that drive the change are a combination of technology, people, and internal/external requirements. Technological advancements in map making, imaging, and printing will continue to change and ATS will have to keep up. Internal requirements emanating from Natural Resources Canada, Treasury Board or other parts of government, will continue to enforce change, as will new requirements from external stakeholders such as the International Civil Aviation Organization and end-users of ATS's maps. The people that are now participating in initiating and implementing the changes at ATS have also changed. Management, as well as employees, are now more involved, as a result of new initiatives such as the formal suggestion and feedback mechanisms in place. The combination of these factors ensures that continuous change will be a feature at ATS.

Management: Shift to a People Focus

During our discussions and analysis of documentation provided, it is clear that ATS has several areas that require action and improvements in human resources. The problem of low morale is definitely an issue. This may very well be a common symptom for federal government employees, due to workforce cuts, job insecurity, and seven-year pay freezes. This is an issue that cannot be easily addressed, but could be improved through the much-discussed process of renewal. As well, there is little career planning with the current emphasis on project-specific training, versus on the basis of career enrichment and forecasting future organizational requirements. It has been argued that a career with the government can no longer be a lifetime experience. This was strongly refuted by one of our management participants. He felt that a lifetime partnership is essential in terms of trust and commitment and is still possible for new and existing employees.

For management, all of the elements of continuous change and the aforementioned human resource issues equate to a very full plate. Additionally, in our discussions with both managers and employees, there seems to be a real need for management to be 'people persons'. Employees need managers that they can relate to. There have been improvements in the communications between management and employees, such as the formalized feedback process in ISO. However, there also appears to be room for more communications, on both a uni-directional and bi-directional basis. To ATS's credit, many of these issues have been identified, and all that remains is for clear concrete action in these areas.



Union Presence

Throughout our interviews and discussions at ATS, there was little visibility of the different unions, from both a management and employee perspective. We could not find any conclusive reasons why this was the case. The question that begs to be addressed is could unions play a bigger role in the day to day lives of employees at ATS?

Final Comments

The changes that have taken place at ATS, when discussed individually, are not unique. However, when all of these different changes are combined, it could be argued that ATS is a unique workplace in the federal government. ATS has many important human resource issues that have to be addressed, and they are well aware of them. A question that is naturally asked is whether the ATS workplace is a model that is appropriate for all government workplaces? The answer to this question is clearly no because the procedures involved do not necessarily apply to work units with different functions. However, there are certain product-oriented areas of government where many elements of the ATS model, such as ISO 9000 and ABC, could be applied and adapted. What could be a significant role for ATS in the future is that it has the potential to be not only an important source for shared learning within Natural Resources, but for government in general.



Appendix 1: People interviewed

Director General, Mapping Services Branch: This person has held this position for 2 ½ years, and has been with NRCan for 15 years. He is responsible for providing overall direction at ATS, including financial reporting, setting the milestones for and reporting on performance, Human resources, morale, managing change. He is also on the Y2K management team at the departmental level.

Director, Aeronautical and Technical Services: This person has worked in the federal government for 29 years and has been Director of ATS since 1992. He was one of the major drivers of the change in orientation of the mandate of ATS, from an abstract safety orientation towards cost recovery and a financed-based determination of safety.

Manager, Quality Management System: This person has been with ATS for 24 years. He was the former Manager of Engineering and has held his current position since 1995. He was instrumental in getting ATS registered ISO 9001 and continues in his role to ensure that all processes at ATS are managed according to quality principles. Other responsibilities include digital aeronautical products.

Project Leader, Engineering: This person came from the private sector in 1995, and has held this position since that time. She is responsible for supporting the production teams and related software procedures, and for research and development for new products and procedures.

Team Leader, Aeronautical Charts: The team leader has been with ATS for over 12 years and has been in this current position for about 1 ½ years. He is involved in the manipulation of new data sent in by clients to make modifications to charts. Although this is currently being done in the conventional method, he is one of 14 project leaders who has responsibility for the conversion of this work to digital technology. In addition, he is the lead internal auditor, and a designated authority for the ATS discrepancy management system (corrective and preventive action) at ATS.

Product Specialist: This person has been with ATS for 6 1/2 years, and has held her current position for 4 years. She is on a team of people that creates air traffic control charts, and maintains them by making changes as necessary every 56-day cycle. She also has some Project Leader responsibilities related to the implementation and maintenance of ATS procedures and documentation.

General Trades, Imaging: This person has worked in government for 27 years and has worked at ATS for about 8 years. He is involved in research and development on new developments in mapping, and in monitoring developments in other areas such as photography to find applications to mapping. He serves as a trainer to new people in his area, as well as a general trouble-shooter.



Natural Resources Canada: Aeronautical and Technical Services

First Pressman, Offset Press This person works in the printing shop of ATS, which is the final stage in the production cycle. He has been with ATS for 32 years, although during this period his shop was spun off from ATS to the Canada Communications Group and then returned to NRCan several years later. He has held his current position within ATS for 2 years.



Appendix 2: Production Areas within ATS

Aeronautical Charts Service

Amendments to aeronautical charts are submitted to the *aeronautical charts service* area of ATS by users of the charts such as the Department of National Defence, Transport Canada, and NavCanada. Database specialists at ATS maintain a database of these charts and process the amendments, which are called Flight Information Amendments (FIA). An amendment might include, for example, a change in the positioning of an airport runway, or a change in the phone number of the air traffic controllers on the ground. Charts are then generated by specialists who have expertise in the areas of aeronautical publishing, mapping and cartography. There are specialists for each of the products that ATS generates (see below). A team of engineers supports and assists the publishing functions, and are also involved in research and development to seek out improved production procedures.

Cartographic Imaging

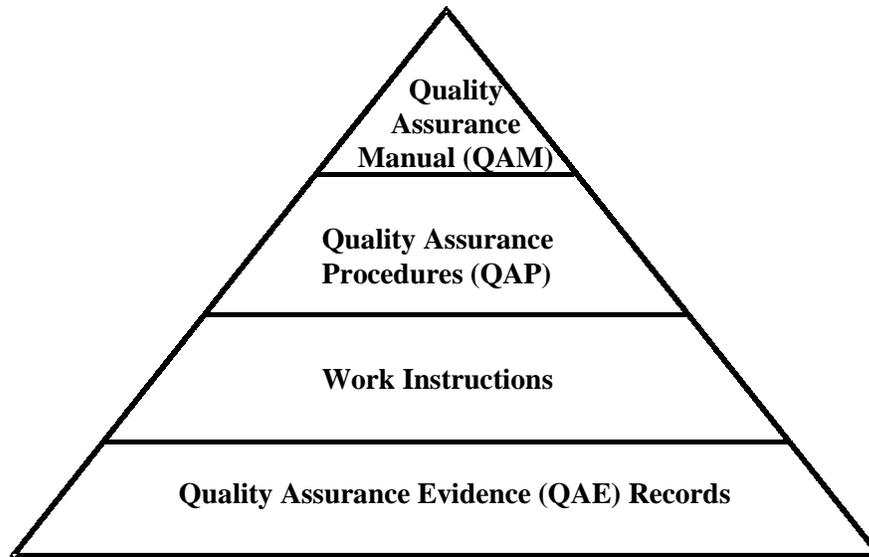
At the Imaging phase of production, the graphics and text compiled in the previous stage are transformed into lithographic (printable) film and media (e.g. CD Rom). Imaging has been undergoing major changes because this process has been shifting from conventional (photo-mechanical) to digital technology. Some employees (called process specialists) at ATS continue to work in conventional imaging, while others have shifted to digital imaging.

Cartographic Printing

The printing process is the last stage in the 56 day cycle before the charts are shipped to clients. It includes plate-making, printing and bindery operations. Twelve workers in this area work on long shifts that allow the printing presses to be operated efficiently.



Appendix 3: The ISO 9000 documentation structure at ATS



Level 1

The Quality Assurance Manual (QAM) is a short 45 page document that is the basis of the ATS quality management system. It outlines the highest level procedures of the organization and includes the framework and references to the specific procedures and forms the first chapter in the ATS Quality Manual.

Level 2

The Quality Assurance Procedures (QAP) cover the 20 elements of ISO as they relate to ATS's operations. For each element there is a procedure with reference to specific work instructions and evidence for each segment of the process. There sponsors or co-sponsors for each QAP. The 20 QAPs forms the second chapter in the ATS Quality Manual.

Level 3

Work Instructions outline, on an individual basis, the procedures that detail the processes. A comprehensive description of the roles and responsibilities of each member of a team is outlined in these comprehensive manuals. These manuals are available for employees to refer to as needed.

Level 4

These are the Quality Assurance Evidence records. These records are maintained as part of the quality system.