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CONTROL TOWER AT QUEBEC CITY'S JEAN LESAGE INTERNATIONAL AIRPORT MOVES INTO THE HIGH-TECH ERA

by Jean-François Bellemare

Is it possible to create a work environment on a human scale in an atmosphere where high technology predominates and errors are unacceptable ... in an airport control tower, for example? *La Brousse* decided to go see for ourselves.



In our July 2006 issue, we published an article in which some people in the know at the Flight Information Centre at Quebec City's Jean Lesage International Airport told us that some major changes were about to be introduced in the control tower. In this issue, we've decided to follow up and see how these changes have gone.

GREAT TIMING

The festivities surrounding the 400th anniversary of the founding of Quebec City certainly made it an optimal time for these changes in this airport's control tower. The sizable increase in the number of international flights, a big air show, and visits by numerous foreign dignitaries all combined to create an extraordinary opportunity to promote aviation safety and the leading-edge technology that supports it, while spotlighting the skills of the people most directly responsible for keeping our skies safe.

In early July 2008, *La Brousse* visited NAV CANADA's head office in Ottawa to meet with Media Relations Manager Ron Singer and Media Relations Advisor Nadège Adam. We had come to find out what the technological changes in the Quebec City control tower had consisted of. But we then learned that these changes had affected the majority of the control towers at Canadian airports and did not involve technology alone, but the human factor as well.

NAV CANADA had wanted to create a work environment on a human scale by taking the needs of its employees and of the users of its services into consideration. NAV CANADA also wanted to increase the safety of the air navigation system and the productivity and effectiveness of its air traffic controllers, by improving their technology.

La Brousse found NAV CANADA's project especially interesting, because pilots of all kinds would derive benefits from it both directly and indirectly.

SEEING FOR OURSELVES

On July 14, we went to the Quebec City control tower to meet Nicolas Jean, the manager of the control tower and flight information centre. Nadège Adam of NAV CANADA also was present.

When we entered the control tower where the air-traffic controllers were working, nothing was like anything we had ever seen or felt before; everything was new. In this workplace, all was hushed—no more sound of flight service strips clicking into place on their racks, no more noise from printers or computers. There were still the conversations of controllers and pilots exchanging information in technical language, but they were clearer, without all the background noise that used to add to the controllers' stress and fatigue.

As Nicolas Jean explained to us:

"In the new control tower, the workstations are equipped with touchscreens that can be configured according to our needs. Many different but complementary applications can be displayed on certain screens, including EXCDS. The furniture is flexible and adaptable, so that the controllers can choose the working positions in which they feel most comfortable—standing, or sitting in a chair with arms, or on a stool. They can easily adjust the height of their work tables, keyboards

and flat screens, and orient these screens at whatever angle they like.”

“In this work environment, there are no more computers and no more printers running. They have all been placed in a room on a lower floor where the temperature and humidity are controlled, so that the service and maintenance staff can work comfortably, without interfering with the air traffic controllers.”

HIGH-TECH EQUIPMENT

The new high-tech systems at the Quebec City control tower went into service in April 2008. This equipment replaced the RAMP (DES), MACS, and NFDPS and the paper flight progress strips. Out of necessity and for the sake of safety, certain pieces of traditional equipment have been kept on hand for use in emergencies; they include printers, emergency radios safety stations that allow communication with pilots by light beams.

The IIDS computer platform supports the following applications: EXCDS (flight planning), NARDS (radar display), OIDS (weather information) and CVIDS (other information). It is infinitely flexible and can be adapted to the needs of each control tower individually. Because the systems are integrated and can communicate with one another, control of the airspace for which NAV CANADA is responsible is even faster and more accurate, and therefore safer.

THE NEW SYSTEMS

ASDE (Airport Surface Detection Equipment)

This equipment has been in place in the Quebec City control tower since 2004. It detects all objects on the ground, whether they are stationary or moving, on the taxiways or on the runways. It provides visual surveillance 24 hours per day, under all weather conditions, including fog, rain, and snow, which makes it an invaluable piece of equipment for the air traffic controllers and for the safety of ground vehicles and aircraft.

The ground radar can detect the unexpected presence of a vehicle, an aircraft, or even an animal in manoeuvring areas where it might endanger aircraft safety. If the obstacle is in the path of a manoeuvring aircraft, the pilot can then be informed and take action to avoid a collision.

This equipment also lets controllers see if an aircraft on the ground is approaching a runway integrity zone (the 200-foot line) too quickly, and alert it so that it does not cross this line.

This ground radar with its colour screen is one more addition to the range of equipment that now ensures greater safety at airports in Quebec and throughout Canada.

EXCDS (Extended Computer Display System)

Nicolas Jean explains:

“This new system replaces the traditional paper flight strips that were used in the past.

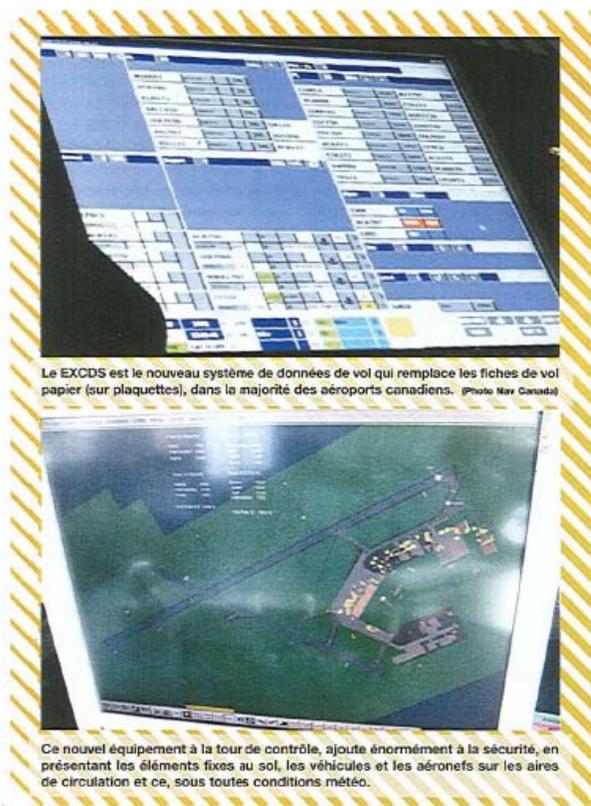
“The EXCDS includes a flat touchscreen, with very clear information in terms of the alphanumeric characters that identify each aircraft. This feature enhances safety yet further, both for communications with pilots and for the air and ground controllers.

“This system can display many applications on screen simultaneously, which makes it highly flexible. For example, if necessary, a controller can select the “Ground Destinations” table, which shows a good many airports around the periphery of Quebec City, and to which of them a

particular aircraft is headed. One substantial benefit is that controllers can now exchange information faster, which means that they can devote more time to aircraft movements on the ground and in the air and to communications with pilots.

“There are no more printed or handwritten paper strips, so there are fewer rejects. What is more, we no longer run out of paper flight strips for the printers.

If a failure ever occurs in the EXCDS system, the controllers can rely on an emergency printer and go back to using



paper flight strips. This back-up system lets us maintain operations even when a system failure occurs.

NAV CANADA's Nadège Adam was proud to tell us about the EXCDS system:

"This high-tech equipment was created by NAV CANADA. It is used in many control towers across Canada. Our system is so effective that the civil air navigation organizations in the United Kingdom and Denmark have acquired it for some of their largest control towers. This Canadian technology is currently in operation in four control towers in the London region—Gatwick, Heathrow, Stansted, and Luton—as well as in Copenhagen.

NARDS (Auxiliary Radar Display System)

NARDS is the new air radar system used at Canadian airports.

This system is very simple to use. It can be easily configured to meet each airport's specific air-traffic-control requirements. Its colour screen is ergonomic, with adjustable viewing angles, and provides better visual impact than the old system. The information displayed next to the mouse cursor (aircraft identification, altitude, aircraft climbing or descending, aircraft speed, and other information) is determined by the air traffic controller's requirements. The controllers can use various parameters to adapt this equipment to their personal preferences.

This radar screen can also be mobile to meet specific requirements.

NVCS (National Voice Communication System)

The NVCS system has been used in most of the control towers in Canada, in the flight information centres (FICs), and in the flight service stations for a few years now, but it is new to the Quebec City control tower.

In addition to offering high performance, flexibility, and user-friendliness, this new communications system takes up much less space than the one that was used a few years ago.

AUXILIARY WORKSTATION

This workstation is an additional position that can be used in emergencies or when needed for other reasons. If an equipment

failure occurs, this workstation can be put into service almost instantly, because it has all the necessary equipment.

PERSONNEL TRAINING

When the new technology was introduced, the air traffic controllers had to set aside the knowledge that they had been applying for years, because nothing was the same anymore. It was a matter not of taking refresher training, but of acquiring a whole new set of knowledge, and it took about six days. Then there was a transition period that lasted a few weeks, under the supervision of an instructor.

SAFE AIRSPACE

As of 2008, the airspace over Canada has never been so safe, thanks to the skills of our air traffic controllers, supported by leading-edge technology.