

TECHWATCH Bulletin

NAV CANADA

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PART I: SYSTEMS, EQUIPMENT AND FACILITIES

GAATS (Gander automated Air Traffic System) - Update

GAATS ADS functionality was implemented in Gander on November 9, 2004. This functionality will allow the controller to request on-demand position reports and establish waypoint, periodic, vertical and lateral deviation event contracts. Although the capability has been implemented, it will not be activated until controller and DSC training has been completed. That training is being scheduled around the Gander CAATS activities. Initially the Centralized ADS Waypoint Reporting (CADS) functionality, currently provided by ARINC, will be activated first and will result in significant financial savings for Nav Canada. We are attempting to do the training and implement this part prior to Christmas, 2004. Full ADS functionality will be activated after that and when all additional training is completed.

The evaluation of the new GAATS conflict algorithms in Gander has generated a few requests for changes and corrections. These are being programmed and testing will commence after their completion. It is anticipated that several months of testing will be required to ensure that we can certify with confidence. It is currently scheduled for implementation in Gander in the first quarter of 2005.

Contact: Harold Martin, Manager Flight Data Processing, (613) 248-7509. ▲

Oceanic Clearance Processor (OCP II) – Update

Software is being developed to update OCP II to conform more closely to the ARINC 623 Specification for Oceanic Clearances. It will implement a feature necessary to make the process voiceless and add the capability for pilot requests to be processed.

Contact: Harold Martin, Manager, Flight Data Processing, (613) 248-7509. ▲

North Atlantic Ground/Ground Data Link – Update

The Gander flight data processing system (GAATS) has had the North Atlantic Common Co-ordination Interface Control Document functionality for ground-to-ground data link communications since 1996. Once implemented, the current controller to controller telephone co-ordination will be reduced or eliminated. Other states have recently implemented this capability and testing is ongoing with New York and Reykjavik, as higher priority initiatives permit. An operational trial between Reykjavik and Gander was completed in May. The current plan is to implement the Gander/Reykjavik and Gander/New York ground/ground data links in the first half of 2005.

Contact: Harold Martin, Manager, Flight Data Processing, (613) 248-7509. ▲

Flight Information Management System (FIMS)- Update

FIMS will replace the MIDS and FWGS with an integrated and scalable system that includes additional functionality such as electronic flight data strips, paperless forms and advanced sectorization capability to support FICs.

The system is comprised of two parts: Flight Data and METLAB. Upgrades, which include newer faster processors and porting to a linux operating system, are mostly completed. Metlab Operational training at the Halifax FIC will be completed by Dec.17, 2004. Operational evaluations and technical training are planned for completion by March 2005. Commissioning of Metlab at Halifax is planned for Spring 2005. The Flight Data portion of FIMS is undergoing revisions to address the requirements identified by evaluations. The Kingston FSS will receive an updated full FIMS system following console upgrades. After the usual Operational and Technical acceptance testing process has been completed, FIMS is planned to be commissioned at Kingston late Spring/early Summer 2005.

Contact: Harold Martin, Manager, Flight Data Processing, (613) 248-7509 . ▲

New Radars in the North – Update

The Northern Radar Project, started in 1999, is essentially completed. NAV CANADA added six new sites to enhance radar coverage where air traffic numbers warranted. These are: Yellowknife (NT), Kuujuaq (QC), Iqaluit (NU), La Ronge (SK), Chisasibi (QC) and Stony Rapids (SK). Stony Rapids, the last site in this series, is in the final phase of certification leading to operational use. In addition to these new sites, the Brisay (QC) radar facility was upgraded to the new Mode S technology. NAV CANADA currently operates a network of 45 Surveillance radar facilities, not including Stony Rapids.

NAV CANADA is conducting a Business Case Analysis to examine and compare the benefits and costs of using either radar or ADS technology to improve flight profiles for air traffic routinely traversing the Hudson Bay area. The benefits were determined in collaboration with the major customers operating in this airspace and knowledgeable air traffic controllers in this area. Results of the analysis are expected in January 2005.

Contact: Lanny Beischer, Manager, Surveillance Systems, (613) 248-7227. ▲

Pre-Departure Clearance (PDC) – Update

Pre-Departure Clearance (PDC) combines EXCDS and datalink capabilities to provide initial IFR departure clearances to subscribing air carriers, reducing voice communications and frequency congestion. PDC is in operation at Vancouver, Calgary, Edmonton, Saskatoon, Winnipeg, Toronto and Halifax. PDC will be added to Montreal on December 2nd and Ottawa in mid-December. Plans are underway to expand PDC service to SITA subscribers, and to upgrade to the 623 communications protocol.

Contact: Lanny Beischer, Manager, Surveillance Systems, (613) 248-7227. ▲

ASDE - Update

Airport Surface Detection Equipment (ASDE) systems are becoming increasingly sophisticated and important as a method of reducing runway incursions. The contract for new ASDE systems for Halifax, St John's, Quebec City, Montreal Dorval, Ottawa, Winnipeg, Calgary, Vancouver and NCTI has been awarded and the plan is to have the systems installed over the next three years.

The Vancouver ASDE was commissioned on 05 September 2003. The Calgary system has been successfully installed, with Systems Acceptance Testing (SAT) completed in October 2003. Work continues on fine tuning the radar during snow conditions. The Dorval ASDE was installed in two phases to minimize downtime. The Radar Data Processing (RDP) equipment has been installed and SAT completed in December 2003. Phase 2, installation of antennae and tx/rx equipment was completed in May. Operational Readiness Demonstration began in early June 2004. Ottawa was the next system to be replaced following Dorval, with Phase 1 (RDP) completed in early July 2004, followed by antennae and tx/rx being replaced in late August/early September 2004. Operator training has been completed and the system is ready for ORD. Following the Ottawa installation will be Quebec City, with the new system installed and undergoing local adaptation in early November 2004.

Contact: Lanny Beischer, Manager, Surveillance Systems, (613) 248-7227. [▲](#)

SASS (Scheduling & Sequencing System) – Update

The Scheduling and Sequencing System (SASS) is a computer-based system used to assist Air Traffic Management Unit (TMU) controllers in allocating available landing slots. It will provide the capability to apportion potential delays (into designated major airports) when demand exceeds capacity. SASS installations are planned for Toronto, Vancouver and Calgary operations. SASS will provide the ability to maximize airport efficiency and deal with traffic surges.

Some SASS capabilities in Phase 1 of the project will provide but are not limited to the following:

Blocked slots and intervals

Capability to set flight and blocked slot priorities (routine, exempt, priority)

Manual time assignment (drag & drop on timeline)

Manual meter fix assignment (drag & drop to another timeline)

Pre-departure schedule (Airport, Airline/Operator, Aircraft)

Specify airport and runway arrival rates dynamically in the future

Set bedpost priorities on a timed basis

Set an aircraft in suspend status

Handle stream classes

Statistics logging

SASS Schedule:

Site	Install Equipment and Training Software	Commission
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Toronto	Done	March/April 2005
Vancouver Surrey	Done	TBD
Edmonton (for Calgary)	May 2005	TBD

SASS Certification Testing is ongoing at the TSC

Contact: Larry Everett, Flight Data Processing Specialist - ATS, (613) 248-6875. ▲

Pilot Information Kiosks – Update

The Pilot Information Kiosk is designed to give pilots quick and accurate weather and aeronautical information through Internet and Phone, in support of the interpretive briefings provided by flight services specialists at FICs.

Seventy-eight (78) sites across the country now have kiosks. A listing of these sites is available at www.navcanada.ca. Forty-three (43) sites are using high-speed technology. At dial-up sites, when high-speed service becomes available, the decision to upgrade is based on cost and usage.

Contact: William Estrada, Manager FSS Information Systems, (613) 248-6872. ▲

PATWAS – Update

The Pilot's Automatic Telephone Weather Answering Service (PATWAS) is being expanded and enhanced. From its humble beginnings as a prototype system in Ontario, to its earlier introduction in the west, PATWAS is becoming a truly national system offering bilingual, improved weather product handling, more responsive menu navigation for users, voice recognition and faxback capability. The PATWAS systems installed at Quebec, London, Kamloops, Edmonton, Halifax and Winnipeg FICs are now operational. The launch date for the Northern FICs is 2005/2006.

Contact: Barry Winch, Acting Manager, Communications & Facilities, (613) 248-6979. ▲

D-ATIS/TVGS - Update

Similarly, our D-ATIS/TVGS (Data Link – Automated Terminal Information Service and Text to Voice Generation System) is being deployed to cut down waiting times for routine information by first automatically converting text ATIS messages to voice and broadcasting them on the appropriate VHF frequency. At predetermined towers, a copy of the text message is also relayed to third party distributors for data link dissemination on demand. The TVGS is working well and we are expanding the available vocabulary to improve processing of REMARK, PIREP, AIRMET and SIGMET. D-ATIS has now been commissioned at the following towers:

DATA LINK Tower

Non DATA LINK tower (VHF ATIS only)

Saskatoon	Quebec City	Sault St. Marie
Thunder Bay	Gander	St-Hubert
Regina	St. John's	Sudbury
Vancouver	Dorval	Waterloo
Calgary	Edmonton Int.	Edmonton City Centre
Toronto	Moncton	Toronto City Centre
(Pearson)	Victoria	London
Ottawa	Mirabel	
Halifax	Kelowna	Buttonville (Deferred to FY 04/05)
Winnipeg	Abbotsford	
Hamilton		

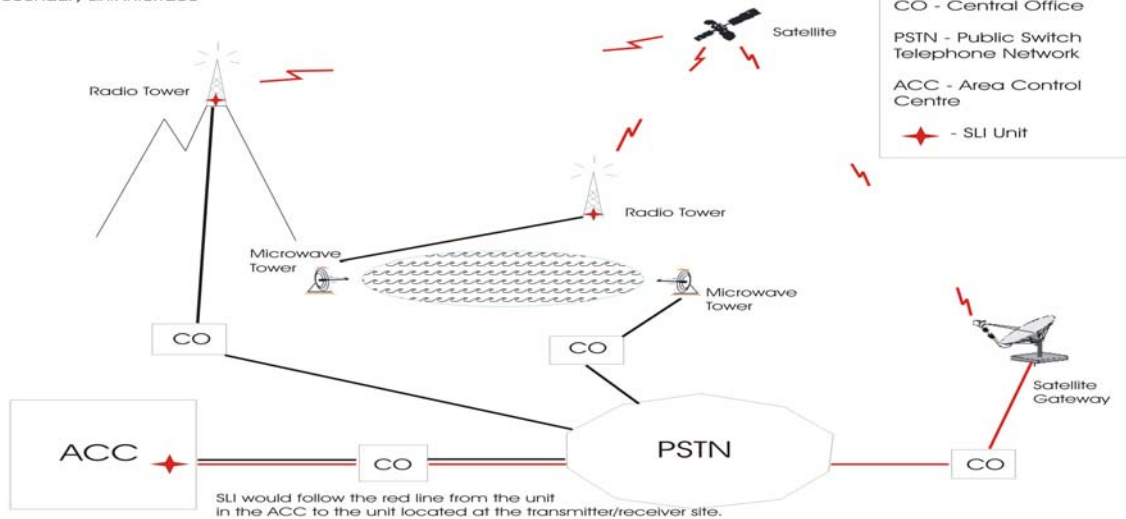
Contact: Barry Winch, Acting Manager, Communications & Facilities, (613) 248-6979. ▲

Secondary Link Interface – SLI - New

Nav Canada is adding a layer of telecommunications redundancy to selected remote radio transmitter/receiver sites, thereby helping to ensure users continue to receive preferred routes and altitudes, even if we experience commercial telecommunications outages. There are currently a number of remote radio sites throughout the country, called PALs for Peripheral Audio Links, which have limited or no telecommunications circuit diversity. These PALs allow a controller in the Winnipeg Area Control Centre, for example, to have direct communications with an aircraft operating in the area of Churchill. Normally, the last link to a PAL is serviced by a single source commercial landline or microwave facility and therefore, diversity is not available from the last central telecommunications office (CO) to the remote site. Other sites have only one landline link for a certain distance because the telecommunications service provider cannot provide a commercially viable second line. The sites affected tend to be remote and as such, response time for service/repair is slow and usually delayed.

The results of a breakdown or failure of the single link are possible delays and reductions in preferred routes and altitudes. Without direct communications aircraft need to be restricted to specific routes/tracks, and they may not get a requested altitude change.

The SLI, which has been developed by NAV CANADA, provides an emergency link to a PAL via either a public switched telephone network (PSTN) or a satellite dialup network (SDN). The system enables air traffic controllers to continue to communicate with pilots over the functioning PAL in the event of main communications link failure. Two sites are currently equipped with this technology, Churchill, MB and Trepassy, NL. Procurement and installation for additional sites has been approved for early 2005.



Contact: Barry Winch, Acting Manager, Communications & Facilities, (613) 248-6979

Aviation Weather Web Site (AWWS) – Update

The ability to file a flight plan over the Internet was made available to the public on May 25, 2004. After the first six months, over 1600 clients have registered, 1200 have created user accounts and over 2000 flight plans have been filed.

The Aviation Weather Web Site now averages 25,000 visits and 5500 NOTAM requests per day.

On Sept. 30, 2004 Weather Camera (Wx Cam) images were added to the website. This feature is especially beneficial in remote and data sparse areas such as the B.C. coastal region, where weather conditions vary greatly and VFR operations are geographically restricted.

Other future plans include the gradual addition of the following features over the next one-to-five years:

- Improve the VFR/IFR “dot plot” displays by developing a “mouse over” display of tafs or metars;
- Add atmospheric vertical sounding data (tephigrams) for the use of glider pilots;
- Add colour imagery from Remote Video Acquisition System (RVAS) weather cameras (Fall 2004);
- Add the ability for registered users to select a series of forecast products and observations, and save them as a package for subsequent recall;
- Add the ability to navigate back from displayed graphics such as the GFA or FD charts without using the browser “back” button;
- Add colour satellite imagery, as is found on the Environment Canada public site;
- Add looping capability for radar and satellite imagery;

- Add a “printer friendly” capability that will correctly orient weather charts and fit them to a single page;
- Add some Pacific Coast weather charts produced by the Department of National Defence;
- Design a “mouse-over” capability for the GFA, where location names will appear when a user’s mouse cursor touches a reference point;
- Add Gander Oceanic sigmets and aireps;
- Develop the capability to download upper wind and temperature information in a format that can be ingested by flight planning software such as Destination Direct or Jeppesen Flight Star;
- Design a method to allow book-marking of dynamic web pages;
- Design a method to download information to a personal data assistant (PDA);
- Provide airport ATIS broadcasts via the web;

The Internet accessible Automated Supplementary Enroute weather Prediction system (ASEP) is expected to become operational in late Winter 2005. Through the Aviation Weather Web Site, this system will allow users to select weather predictions derived from Environment Canada’s super computer model of the atmosphere. The predictions will be specific to the user’s route, date/time of the flight (up to 40 hours into the future), and preferred cruising altitude. The ASEP predictions are presented to the user as colour profile (cross section) and plan view (bird’s eye) graphics which are very easy to interpret. Pilot and flight dispatcher users will have access to the ASEP predictions, as will our Flight Information Centre (FIC) weather briefers.

Another new service planned for late December 2004, is Weather Mail (Wx Mail). It will allow registered users to automatically receive an email delivery of weather information from their "My Wx Data" folder, directly to their personal email account, on days and at times (up to 5 times per day), of their choosing.

Contact: John Foottit, Manager Aviation Weather Services (613) 563-5603. [▲](#)

Flight Information Centre Project – Update

The Flight Information Centre Project (FIC) is seeing flight information services such as pre-flight weather briefings, flight planning and en-route radio communications centralized across Canada into nine facilities: Halifax, Quebec City, London, Winnipeg, Edmonton, Kamloops, Whitehorse, Yellowknife and North Bay.

In order to ensure consistent service delivery at all times, the FICs are being implemented progressively in three phases. The initial rollout saw FICs established at Halifax, Quebec and Edmonton; Phase II saw FICs established in London, Winnipeg, and Kamloops. Of these six southern FICs, five have completed service transitions and Kamloops FIC is planned to be completed by end of January 2005. The third phase, involving the three northern FICs, is progressing slowly with an anticipated Spring 2006 timeframe completion of North Bay FIC, with the others to follow. The work involved for the final three FICs is primarily the installation of new systems and equipment in order to be brought up to current FIC standards.

Contact: Carol Adams, General Manager Airport Operations - Flight Information Centres, (613) 248-4080. [▲](#)

Converging Runway Display Aid (CRDA) - Update

CRDA has proven to be a very useful tool in optimizing the use of converging runways and in determining in-trail spacing for aircraft on approach or converging enroute. It has now been implemented in Calgary and Halifax, TCU and Tower and is being used in enroute operations as an In Trail Spacing Aid (ITSA) in Vancouver.

Several enhancements have been made to the CRDA functionality and are included in version 1.10.3 of RSiT. Certification has been completed and site testing began in Vancouver June 21/22. Pending successful completion of the site test, 1.10.3 will be distributed to Edmonton and Winnipeg. Montreal will receive 1.10.3 when French testing is completed, which should be in the near future. Toronto will receive the system when testing with the RDPS 163 cards is completed. Moncton and Gander will not receive RSiT Version 1.10.3, as they have CSiT.

This version of software incorporates a 'Super-Smart' CRDA In-Trail ghosting capability. The previous 'Smart In-Trail Ghosting' feature of CRDA used the wake turbulence classification of the leading aircraft only in order to determine the spacing to be used when projecting the In-Trail ghost images. This version considers the wake classes of both the leading and the trailing aircraft

A new CRDA enroute configuration had been introduced. The enroute configuration 'flattens' all ghosts on to the beta baseline, providing a much better representation of relative spacing between aircraft that are on widely divergent flight paths.

CRDA has also been modified to handle special weight category aircraft, such as the B757 (a special weight category aircraft is one whose wake turbulence characteristics are treated differently depending on whether it is the leading or trailing aircraft in a pair). This change was driven by the fact that there is an increasing number of aircraft that fall into the special weight category class.

Contact: Christine Guerin, Manager ATM Service Design, (613) 248-3921. [▲](#)

Multilateration (MDS) – New

NC is presently preparing to test a Rannoch MDS in Calgary. We have tested a MDS from Sensis in Toronto in 2001 with excellent results. An MDS is a high performance and cost-effective source of position and identification data on transponder equipped aircraft and vehicles on an airport. The system detects and tracks aircraft and vehicles equipped with Mode S, ATRBS and Automatic Dependent Surveillance – Broadcast (ADS-B) transponders. It is being considered as an augmentation system for our ASDE's. Currently we have prime radar as the sole sensor for our ASDE systems, which has limitations due to the technology in

use, i.e. we have trouble in snow conditions, and along edges of maneuvering areas due to ground clutter and reflections.

Contact: Lanny Beischer, Manager, Surveillance Systems, (613) 248-7227. [▲](#)

Part II: Procedures

Conflict Alert (CA) – Update

Conflict Alert (CA) is functionality within RDPS that is designed to provide the controller with sufficient advance warning to avoid a potential mid-air collision. As the CA system provides critical safety alerting, exhaustive testing has taken place both at the TSC and in the field to ensure that the system functions as required while nuisance alarms are minimized. Over the past year, the software has been modified to incorporate design changes indicated by operational trials in Moncton and Toronto as well as to implement alerting capability in RVSM airspace.

Conflict Alert functionality is now operational in all airspace above 14,000 feet controlled by Gander, Moncton, Winnipeg, Toronto, Montreal, Edmonton and Vancouver ACCs with the exception of the designated suppress areas.

Contact: Lanny Beischer, Manager, Surveillance Systems, (613) 248-7227. [▲](#)

Flight Management Systems (FMS) & Area Navigation (RNAV) Standard Arrival/Departure Routes (STARs & SIDs) - Update

There are currently forty published RNAV STAR procedures in Canada located at ten of our major airports including three in Hamilton which are connected to RNAV approaches. The Hamilton procedure represents the first time that aircraft flying an RNAV STAR can transition to an approach system without need for ground-based navigation aids.

It is NAV CANADA's intent to introduce RNAV STAR procedures at more domestic airports.

New RNAV SID trials commenced at the Pierre Elliott Trudeau Airport in Montreal. These trials started on August 5, 2004 and American Airlines is the main participant.

The YUL SID trial is being expanded to include aircraft that have DME/DME/IRU equipment with automatic runway updating. It is hoped this new trial procedure will be published in the January 20, 2005 issue of CAP.

RNAV SID procedures are also being developed for Halifax International Airport and Lester B. Pearson International Airport in Toronto. Already established to meet this goal is a Greater Toronto Airports Authority RNAV SID Working Group. Members of this working group include staff from GTAA, TC, Air Canada and NAV

CANADA. This group will focus on the development and implementation of RNAV SIDs at Toronto's LBPIA.

In addition, NAV CANADA is also co-ordinating directly with WestJet on the development of RNAV procedures that will eliminate non-precision approaches.

Contact: Doug Buchanan, Manager, ATS Operations and Development, (613) 563-5986. ▲

RVSM IN SOUTHERN DOMESTIC AIRSPACE (SDRVSM) – Update

North America's Air Navigation Service Providers and regulators have made a "GO Decision" for continent-wide implementation of RVSM in Domestic and off-shore airspace. At a meeting in Washington, September 22, 2004 NAV CANADA, the Federal Aviation Administration (FAA) in the United States, and Mexico's DGAC and SENEAM decided to proceed as scheduled with the concurrent implementation of RVSM January 20, 2005 at 09:01 UTC.

RVSM airspace (flight level 290 - 410 inclusive), is exclusionary and aircraft and operators that have not received RVSM approval from their responsible State authority, with limited exceptions, will not be permitted to operate within designated RVSM airspace.

Transport Canada's CBAAC 0226 (issued 2004. 03.19) outlines the process for obtaining RVSM Operations Specification approval, including height-keeping performance monitoring, and may be downloaded from the TC Web site at: tcinfo/civilaviation/commerce/circulars/menu.htm

SDRVSM Guidance Material (Version 2.0) as well as specific guidance material on the Approval of Operators/Aircraft for RVSM Operations (91-RVSM) and other relevant documentation on SDRVSM are posted on the NAV CANADA web site www.navcanada.ca (click on ANS Programs, then click on RVSM)

Aircraft height keeping performance monitoring, can be accomplished by over-flight of a ground based monitoring system or use of a Global Positioning System (GPS) Monitoring Unit (GMU). Two ground based systems, one in the vicinity of Ottawa, ON, the second in the vicinity of Lethbridge, AB, are scheduled to be operational in January / February 2005.

GMU aircraft height-keeping performance monitoring is available on a commercial basis from:

ARINC, Annapolis, MD.
Contact point:
RVSM Ops Center
Tel: 410 266 4707
Email rvsmops@arinc.com

CSSI Inc. Washington, DC.
Contact Point:
RVSM Monitoring
Tel: 202 863 2175
Email monitor@cssiinc.com

Operators intending to operate in RVSM airspace that do not have RVSM aircraft and operator approval, are urged to start the RVSM authorization process with Transport Canada as soon as possible.

The following documents have been placed on the NAV CANADA RVSM web site, <www.navcanada.ca> (click on ANS programs, then click on RVSM):

SDRVSM Implementation Plan; SDRVSM Guidance Material Version 2.0; SDRVSM Impact Analysis, CBAAC 0226, Aircraft Monitoring Requirements, 91-RVSM-Change 2 (Guidance on aircraft/Operator RVSM Approvals), AIC 1/04, AIC 2/04 and an SDRVSM Contacts List.

Contact: Don MacKeigan, SDRVSM Project Manager, (613) 563-5678. ▲

SatNav – Wide Area Augmentation System (WAAS) in Canada – Update

As described in previous TechWatch Bulletins, the U.S. Federal Aviation Administration (FAA) commissioned WAAS in July 2003. WAAS signals already cover much of Canada, with excellent coverage in the western provinces thanks to the FAA's network of stations in the lower 48 states and in Alaska.

In accordance with the agreement with the FAA to field four WAAS stations in Canada, NAV CANADA worked with the FAA through the summer to complete detailed site plans to support the installations in Goose Bay and Gander at the start of summer 2005. The addition of these stations will extend coverage across southern Canada. The other two stations, in Winnipeg and Iqaluit, will be installed at the start of summer 2006.

NAV CANADA's goal is to start providing public WAAS-based approaches in late 2005. It may be possible for operators to be approved for restricted instrument procedures at some earlier date. The FAA recently completed a safety analysis, based on observed WAAS performance, proving that ILS approach design criteria could be used for WAAS LPV procedures. The lowest decision altitude for an LPV procedure will still be 250 feet above ground, versus 200 feet for ILS, but the use of ILS criteria will mean that over 90% of LPV procedures will have decision altitudes at or very near 250 ft above ground.

Another milestone was reached in October when two avionics manufacturers obtained approval for panel-mount GPS/WAAS units capable of flying LPV procedures. It is expected that the first WAAS-capable FMS unit will be available in the 2nd quarter of 2005.

NAV CANADA continues to work with Transport Canada on the regulatory aspects of WAAS operations.

Contact: Ross Bowie, Director, ANS Service Design, (613) 563-5648 or bowier@navcanada.ca. ▲

