



**PART I: SYSTEMS, EQUIPMENT AND FACILITIES**

**GAATS (GANDER AUTOMATED AIR TRAFFIC SYSTEM) - UPDATE**

**CONTACT: HAROLD MARTIN, MANAGER FLIGHT DATA PROCESSING, (613) 248-7509**

Phases 1 & 2 of the North Atlantic (NAT) CPDLC Trials are in operational mode in the Canadian and United Kingdom oceanic airspace over the North Atlantic. More than a dozen of the major airlines are participating with others signing on as their pilot training is completed. At the FANS Implementation Group meeting held in Ireland in early March, Canada advised that we would be ready to commence Phase 3 of CPDLC by early Summer, 2003. The UK advised they would be ready in November, 2003. The US is following a different program and will be implementing the full CPDLC message set in late March, 2003. It is anticipated that Canada and the UK will implement Phase 3 together late in 2003. New versions of software for GAATS and its workstation (GSIT) will be installed in Gander in April, 2003. This software will fix very high priority problems and add new workstation functionality requested by Gander.

**FANS 1/A – ADS WAY POINT POSITION REPORTING - UPDATE**

**CONTACT: HAROLD MARTIN, MANAGER, FLIGHT DATA PROCESSING, (613) 248-7509**

The FANS 1/A ADS Waypoint Position Reporting system (CADS) has been very successful and well received by our customers. However, it provides only a small portion of the full FANS 1/A ADS capability. It does not allow demand reports nor event reports. CADS also does not provide end-to-end connections between the aircraft and the ATS ground system (GAATS). The connection is between the aircraft and a processor at the communications service provider's location in Annapolis, Maryland. The connection from Annapolis to the ground system is via AFTN. A project to add the full ADS functionality to GAATS is progressing and software delivery is expected in July, 2003. Implementation is tentatively planned for Fall, 2003.

**OCEANIC CLEARANCE PROCESSOR (OCP II) - UPDATE**

**CONTACT: HAROLD MARTIN, MANAGER, FLIGHT DATA PROCESSING, (613) 248-7509**

The current Oceanic Clearance Processor (OCP II) was implemented on May 13, 2002. It sends initial oceanic clearances to all aircraft equipped with avionics conforming to ARINC Specification 623 while continuing to serve the current ARINC Specification 620 avionics aircraft. However, unlike the equivalent UK system, it does not allow the pilot to send a clearance request to the controller and it does not provide the capability to send a "Clearance Confirmed" message to the pilot. Without this last item the pilot must still contact Clearance Delivery by voice to confirm the clearance. With it the process becomes voiceless. An upgrade (OCP III) to implement these two features has been defined and will be implemented over the next six months.

**FLIGHT MANAGEMENT SYSTEM (FMC) WAY POINT POSITION REPORTING - UPDATE**

**CONTACT: HAROLD MARTIN, MANAGER, FLIGHT DATA PROCESSING, (613) 248-7509**

Plans are now proceeding to implement waypoint position reporting using other (not FANS 1/A) aircraft avionics packages, e.g. Pegasus, Honeywell Product Improvement Package (PIP), etc. Pre-operational trials are planned for the second quarter, 2003. This would increase automatic position reporting by an additional 100 flights (approximately) per day.



**NORTH ATLANTIC GROUND/GROUND DATA LINK - NEW**

**CONTACT: HAROLD MARTIN, MANAGER, FLIGHT DATA PROCESSING, (613) 248-7509**

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. However, other States have only recently implemented this capability. Technical testing has been conducted with New York and with Reykjavik. These tests identified several problems that are being fixed. Santa Maria have asked to be included in future testing. Once implemented, the current telephone controller to controller co-ordination will be reduced or eliminated.

**FSS WEATHER GRAPHICS SYSTEMS - UPDATE**

**CONTACT: HAROLD MARTIN, MANAGER, FLIGHT DATA PROCESSING, (613) 248-7509**

The FSS Weather Graphics System (FWGS) project is being delivered in co-ordination with the Aviation Weather Distribution System (AWDS) and the NAV CANADA Meteorological System (NCMETSYS) projects to deliver alpha-numeric and graphic weather products to support pilot briefings and ATS operations. There are currently 45 FSS and 4 ACC's that have FWGS and AWDS installed, and there are also 3 support facilities (non-operational units). Two more FSS will be completed this fiscal year. The remaining 26 FSS sites are planned for Phase 3 of the FWGS and AWDS projects, however the start date for this Phase has yet to be determined. ATS facilities that currently do not have these systems have GFAs and other graphic products faxed to them.

AWDS is currently testing a back-up system that will provide redundancy in the service delivery. The FWGS Installations are continuing with Sept Iles being planned for March and Iqaluit for April 2003.

**FLIGHT INFORMATION MANAGEMENT SYSTEM (FIMS)- NEW**

**CONTACT: HAROLD MARTIN, MANAGER, FLIGHT DATA PROCESSING, (613) 248-7509**

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 2 parts; Flight Data and METLAB. The METLAB portion is undergoing performance improvements. Training is being enhanced to include new functionality. A full FIMS installation will occur this Spring in Kingston.

**NEW RADARS IN THE NORTH - UPDATE**

**CONTACT: LANNY BEISCHER, MANAGER, SURVEILLANCE SYSTEMS, (613) 248-7227**

The first four of the new Northern Radars, Kuujjuaq, Yellowknife, Iqaluit and La Ronge are now in operation. NAV CANADA has also contracted for two new radar facilities for Chisasibi, Quebec, in July 2003, Stony Rapids, Saskatchewan, in December 2003 and a replacement for Brisay in August 2003. Additional sites are still under various phases of review, and may be added depending on each business case and available funding.

**PRE-DEPARTURE CLEARANCE (PDC) - UPDATE**

**CONTACT: LANNY BEISCHER, MANAGER, SURVEILLANCE SYSTEMS, (613) 248-7227**

A new Pre-Departure Clearance (PDC) system at Toronto and Vancouver is leading to faster taxi and take-off routines by reducing voice communication requirements and frequency congestion. PDC has also been installed and is now in operation at Calgary, Edmonton, Winnipeg, and Halifax Airports. PDC will be available this summer at Saskatoon.



**ASDE - UPDATE**

**CONTACT: LANNY BEISCHER, MANAGER, SURVEILLANCE SYSTEMS, (613) 248-7227**

Airport Surface Detection Equipment (ASDE) systems are becoming increasingly sophisticated and increasingly important as a method of reducing runway incursions. In assessing the feasibility of an ASDE system for Halifax, the company has determined that, in addition to enhancing safety, ASDE could produce half a million dollars in annual savings for aircraft operators by providing smoother control over movements on the ground. 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.

Recent developments at Halifax have included the installation of the ASDE antenna on top of the tower cab and successful completion of the System Acceptance Test. System Acceptance Testing was carried out in July, with only minor changes needed in the display. Work is continuing to resolve vibration problems caused by wind loading on the antenna. A Company from St John, NB, specializing in vibration problems, visited the tower to investigate the problem. Their report, with recommendations, was submitted in December. Strengthening the tower structure was one of the options presented, however, the work did not produce expected results. Site selection is underway for a stand-alone tower for ASDE antennae.

**SASS (SCHEDULING & SEQUENCING SYSTEM) - UPDATE**

**CONTACT: LARRY EVERETT, FLIGHT DATA PROCESSING SPECIALIST - ATS, (613) 248-6875**

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.

SASS capabilities in Phase 1 of the project will provide:

- 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 times basis
- Set an aircraft in suspend status
- Handle stream classes
- Statistics logging

SASS Schedule:

<b>Site</b>	<b>Install</b>	<b>Commission</b>
Toronto	Spring 2003	May 2003
Vancouver	November 2003 <i>Richmond</i>	March 2004 <i>Surrey</i>
Calgary	2004	2004



**PILOT INFORMATION KIOSKS - UPDATE**

**CONTACT: WILLIAM ESTRADA, MANAGER FSS INFORMATION SYSTEMS, (613) 248-6872**

The Pilot Information Kiosk is designed to give pilots quick and accurate weather and aeronautical information through a variety of media (Internet, Phone, and Fax) in support of the interpretive briefings provided by flight services specialists at FICs. A prototype version of the kiosk is available in Ottawa.

Production and fielding of national operational units is in progress. Forty-three (54) sites across the country now have kiosks; nine (7) sites are currently being under installation preparation.

**PATWAS - UPDATE**

**CONTACT: JOE CLAPP, MANAGER, COMMUNICATIONS & FACILITIES, (613) 248-7240**

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 will soon become a truly national system offering bilingual, improved weather product handling and more responsive menu navigation for users. The target site and revised date for the national launch of PATWAS in London is end of April 2003 and in Quebec City is end of May 2003.

**D-ATIS/TVGS - UPDATE**

**CONTACT: JOE CLAPP, MANAGER, COMMUNICATIONS & FACILITIES, (613) 248-7240**

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 PIREP, AIRMET and SIGMET. D-ATIS has now been commissioned at the following towers:

<b>DATA LINK Tower</b>	
Saskatoon	Quebec City
Thunder Bay	Gander
Regina	St. John's
Vancouver	Dorval
Calgary;	Edmonton Int.
Toronto (Pearson)	Moncton
Ottawa	Victoria
Halifax	Mirabel
Winnipeg	Kelowna
Hamilton	Abbotsford

<b>Non DATA LINK tower (VHF ATIS only)</b>
Sault St. Marie
St-Hubert
Sudbury
Waterloo
Buttonville (Date TBD)
Toronto City Center (Date TBD)
London (planned for end of June 2003)
* Prince George is dropped and the system will be installed at Edmonton City Center (Date TBD)

**AVIATION WEATHER WEB SITE (AWWS) - UPDATE**

**CONTACT: JOHN FOOTIT, MANAGER AVIATION WEATHER SERVICES (613) 563-5603**

Since the initiation of the new weather web site in August 2001, the number of daily site visits has increased from approximately 2,100 to over 20,000. NOTAM information was made available in Jan. 2003. Future plans call for an on-line file-a-flight-plan capability (mid 2003), as well as gradually adding the following features over the next 1 to 5 years:

- add a "push" capability that will allow clients to receive weather information via scheduled e-mails or faxes.
- 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.
- add the ability for registered users to select a series of forecast products and observations, and save them as 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 color satellite imagery such as are 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 users' 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 also expected to become operational in late-2003. Through the Aviation Weather Web Site, this system will allow users to select weather predictions that are 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 color 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 Center (FIC) weather briefers.

#### **FLIGHT INFORMATION CENTER PROJECT - UPDATE**

**CONTACT: CAROL ADAMS, GENERAL MANAGER AIRPORT OPERATIONS - FLIGHT INFORMATION CENTRES, (613) 248-4080**

The Flight Information Center Project (FIC) will see flight information services such as preflight 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 will be implemented progressively in three phases. The initial rollout saw FICs established at Halifax, Quebec and Edmonton, with staff and service transitions commencing in September 2001, November 2001 and April 2002, respectively. Phase II saw FICs commencing transitions at London in September 2002, Kamloops in December 2002 and Winnipeg transition scheduled to commence in May 2003. The three northern FICs locations were identified during an earlier Northern Service Review, but still require new systems and equipment implementations in order to be brought up to current FIC standards. These implementations are scheduled for 2004.

#### **CONVERGING RUNWAY DISPLAY AID (CRDA) - UPDATE**

**CONTACT: BOB ARMSTRONG, MANAGER, ATS SYSTEM EFFECTIVENESS, (613) 248-3921**

CRDA has proven to be a very useful tool to optimize the use of converging runways. It has now been implemented in Calgary and Halifax (TCU/Tower). CRDA is also being used in enroute operations as an In Trail Spacing Aid (ITSA) in Vancouver.



Several enhancements have been made to the CRDA functionality. The 'Smart Ghosting' feature is being improved to account for the weight category of the following aircraft and a new 'Enroute CRDA' configuration is being added. As well, it will be possible to group several different CRDA configuration under one 'parent' configuration, which will make activation of complex, linked configurations easier. These new enhancements will be released with the 1.10.3 version of RSiT.

The next national release of RSiT software, Version 1.10.3 is planned for Spring 2003. It has completed development and, as of this report, has been submitted to Certification.

## **PART II: PROCEDURES**

### **CONFLICT ALERT (CA) - UPDATE**

**CONTACT: LANNY BEISCHER, MANAGER, SURVEILLANCE SYSTEMS, (613) 248-7227**

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 high-level airspace controlled by Gander, Moncton, Winnipeg, Toronto and Edmonton ACCs. We are well under way in implementing Conflict Alert in other ACCs and expect that the CA functionality will be operational in all remaining high-level airspace by the spring of 2003.

### **FLIGHT MANAGEMENT SYSTEMS (FMS) & AREA NAVIGATION (RNAV) STANDARD ARRIVAL/DEPARTURE ROUTES (STARS & SIDS) - UPDATE**

**CONTACT: DOUG BUCHANAN, MANAGER, AIRPORT & TERMINAL OPERATIONAL PROCEDURES, (613) 563-5554**

The RNAV STAR trials in Vancouver ceased with the publishing of three new procedures in the Canada Air Pilot on March 20, 2003. This increases the number of published procedures in Canada to thirty-six. Toronto has four RNAV STAR procedures developed for the "quiet hour" time frame and these are being advanced for publication. Other airports are slated for the RNAV STAR procedures and coordination for development is through the responsible area control center (ACC) and the local aeronautical information services (AIS) field office. The published procedures are continuously being reviewed and modified to meet the needs of both the user and the air traffic controller.

RNAV SID procedure development is ongoing for Montreal, Calgary and Toronto airports. RNAV SID procedures at Ottawa are being refined and trials by Air Canada should commence shortly. Standards will be developed from the data captured during the trial and these standards will be used in the further development of RNAV SID procedures at other Canadian airports.

### **RVSM IN SOUTHERN DOMESTIC AIRSPACE (SDRVSM) - UPDATE**

**CONTACT: DON MACKEIGAN, SDRVSM PROJECT MANAGER, (613) 563-5678**

The concurrent implementation of SDRVSM in Canada and DRVSM in the US Domestic airspace has been expanded to include implementation of RVSM by the Civil Aviation Authority of Mexico (SENEAM). The FAA, NAV CANADA and SENEAM have agreed to the tri-lateral implementation of RVSM, January 20, 2005. It is also expected that this expansion of RVSM will extend south to the Caribbean and South American Regions at the same time. The SDRVSM Project Office has identified a number of operations issues that require resolution to support a transparent interface, under an RVSM environment, at the



common Canada-USA airspace boundary. The FAA and NAV CANADA RVSM Teams will address these issues over the coming months.

We are currently finalizing the SDRVSM Impact Analysis which addresses both costs and benefits associated with SDRVSM. It should be noted that we have had excellent cooperation from our customers in providing both technical and cost information in the context of the impact of RVSM on their operations and planned RVSM certification for their fleet/aircraft.

In the area of aircraft height keeping performance monitoring, we have determined, based on airspace/traffic analysis, that we will deploy two ground based height monitoring systems; one in the vicinity of Ottawa, ON and the other in the vicinity of Lethbridge, AB. It is expected that both systems will be operational in September /October 2004. These systems will support aircraft RVSM certification and perform required monitoring to support ongoing RVSM operations post January 2005.

A number of operators have completed the avionics upgrades to make their aircraft RVSM compliant, over the past six months, and are in various stages of the RVSM certification/operator approval process through Transport Canada.

Over the next few months the Project office will focus on the development of the SDRVSM implementation plan, safety and risk management plans. Our coordination with the FAA is ongoing throughout the Project, as well as consultation with stakeholders. Guidance Material on the Approval of Operators/Aircraft for RVSM Operations (91-RVSM) and other relevant documentation on SDRVSM is posted on the NAV CANADA web site [www.navcanada.ca](http://www.navcanada.ca) under "Service Projects- RVSM"

**SATNAV – WIDE AREA AUGMENTATION SYSTEM (WAAS) IN CANADA - NEW**

**Contact: Ross Bowie, SatNav Program Manager, (613) 563-5648 or [bowier@navcanada.ca](mailto:bowier@navcanada.ca)**

The U.S. Federal Aviation Administration (FAA) plans to commission WAAS in July 2003. WAAS uses a network of reference stations that monitor GPS satellite signals and send data to master stations, which calculate correction and integrity data. This information is broadcast from geostationary (GEO) satellites, orbiting over the equator, to aircraft equipped with WAAS avionics. WAAS delivers 2-metre lateral and vertical accuracy, and supports high availability en route, terminal, non precision approach and two levels of approach with vertical guidance: LNAV/VNAV, which is also available today to aircraft with GPS and Baro VNAV capability; and LPV, which is equivalent to a localizer laterally and somewhat better than LNAV/VNAV vertically. Studies using terrain data at U.S. airports show that LPV approach capability would improve airport usability in many cases.

With the current FAA 25 reference station network, mathematical models show that 99% LPV availability extends to most of BC, Alberta and Saskatchewan, southern Manitoba, southern Ontario and south-western Quebec. Coverage is better in the west thanks to FAA stations in Alaska. Actual measurements in the USA show that the models are quite accurate. NAV CANADA intends to test actual coverage after WAAS is commissioned.

The FAA has asked NAV CANADA if we would be willing to host three WAAS stations in Winnipeg, Goose Bay and St. John's or Gander, to boost LPV availability to 99% in the Maine/New Hampshire area and near Lake Superior. Adding these three stations would extend 99% LPV coverage to the rest of southern Canada except for all of Newfoundland and much of Labrador, where availability would be about 95%. NAV CANADA is studying the addition of a station in Moncton to boost LPV coverage in Newfoundland and southern Labrador to 99%. The cost of extending LPV service farther north would be prohibitively high, and in any case, GEO satellite signals are not usable above about 70 degrees north latitude. To support WAAS service in Canada, NAV CANADA would have to design new instrument approach procedures and implement a system to generate WAAS approach procedure NOTAMs.



NAV CANADA has started discussions with the FAA and is analysing all of the business implications of providing WAAS service in Canada. A key area of interest is the acceptance of WAAS by aircraft operators, as would be demonstrated by the purchase of WAAS avionics. The first new panel-mount WAAS unit appeared on the market in April, at a cost similar to existing GPS units. At least one other manufacturer has offered WAAS upgrades for existing GPS units. Manufacturers have learned many lessons from building GPS avionics, and the standards for WAAS avionics ensure that these units will have many desirable features, including a well-designed pilot interface. Even in the absence of a WAAS signal these units operate as a high-end GPS receiver and provide a higher availability of GPS service. The bottom line is that aircraft operators who are considering equipping with GPS should make WAAS-capable or WAAS-upgradable avionics their first choice.

Customer comments, suggestions and questions to the contact noted in the header would be most valuable as NAV CANADA considers how to react to this opportunity to provide better service at a very reasonable cost.