



**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 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 implemented the full CPDLC message set in 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 to accommodate Phase 3 implementation.

**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. The current plan is to implement the CADS portion of the ADS software this fall (eliminating the need for ARINC CADS) with full ADS functionality to follow early in 2004.

**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. However, due to financial constraints the upgrade has been put on hold indefinitely.

**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. Technical trials began in March. A start date for pre-operational trials has yet to be determined. This would increase automatic position reporting by approximately 100 flights 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 has asked to be included in future testing. Once implemented, the current telephone controller to controller co-ordination will be reduced.

**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 46 FSS and three ACCs that have FWGS and AWDS installed, and there are also three support facilities (non-operational units). FWGS was installed in Sept Iles April 2003. Two more FSS sites, Deer Lake and St. Anthony, have been deferred. Plans to install FWGS in Iqaluit are cancelled. 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.

**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 two 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 – Kuujuaq, Yellowknife, Iqaluit and La Ronge – are now in operation. NAV CANADA has also contracted for two new radar facilities for Chisasibi, Quebec, in August 2003, and Stony Rapids, Saskatchewan, in January 2004 and a replacement for the radar system in Brisay, Quebec in September 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 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 02, with only minor changes needed in the display. Work is continuing to resolve vibration problems caused by wind loading on the antenna. As an alternate solution site selection is underway for a stand-alone tower for the 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	Jan 2004	June 2004
Vancouver Richmond	Feb 2004	Aug 2004
Vancouver Surrey	Feb 2004	Richmond/Surrey Move
Edmonton (for Calgary)	Sep 2004 (Design May 04)	Mar 2005

**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 Internet and Phone, in support of the interpretive briefings provided by flight services specialists at FICs.



Fifty-nine (59) sites across the country now have kiosks and one (1) site is currently 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 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 and Kamloops FICs are now operational. The revised date for the launch of PATWAS at Winnipeg, Edmonton, and Halifax is fall 2003. The launch date for the Northern FICs is 2005.

**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
Edmonton City Centre (July/August 2003)
Buttonville (Date TBD)
Toronto City Centre (Date TBD)
London (Date TBD)

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

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

Since the launch 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 January 2003. Future plans call for an on-line file-a-flight-plan capability (Nov 2003), as well as gradually adding the following features over the next one-to-five 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 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 color 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 Summer 2004. 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 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 Centre (FIC) weather briefers.

#### **FLIGHT INFORMATION CENTRE PROJECT - UPDATE**

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

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 commencing transitions at London in September 2002, Kamloops in December 2002 and Winnipeg 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 2004-05.

#### **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 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.

## **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 Montreal ACCs and in all airspace above 14,000 feet at Edmonton ACC. We are planning to implement Conflict Alert in Vancouver's high level airspace by the end 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 centre (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 implementation of SDRVSM in Canada, DRVSM in the USA, MRVSM in Mexico and RVSM throughout the Caribbean and South America is scheduled for 09:01 UTC January 20, 2005. The expansion of RVSM throughout the Americas from the North Pole to the South Pole will be a significant step in the global implementation and will bridge the current RVSM environments of the Atlantic and Pacific Regions.

NAV CANADA has completed an Impact Analysis which addresses both costs and benefits associated with SDRVSM. We appreciate the 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. The Impact Analysis will be published on our web site as part of the SDRVSM documentation in August 2003.

To support aircraft height keeping performance monitoring, 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 September/October, 2004. Aircraft height-keeping performance monitoring, using GPS based height monitoring units (GMU), is available from:

ARINC, Annapolis, MD.  
Contact point:  
RVSM Ops Center  
Tel: 410 266 4707  
Email [rvmops@arinc.com](mailto:rvmops@arinc.com)

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

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](http://www.navcanada.ca) under "Service Projects- RVSM"

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

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

The U.S. Federal Aviation Administration (FAA) commissioned WAAS on July 10, 2003. As described in the Spring 2003 TechWatch Bulletin, WAAS can support 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.

NAV CANADA is continuing discussions with the FAA on the installation of three or four reference stations in Canada to boost availability of WAAS service in both countries. The aim would be to install these stations in early 2005. NAV CANADA has started exploring the requirements for a WAAS approach NOTAM system, is developing a plan to verify WAAS performance in Canada and is discussing regulatory issues with Transport Canada.

GPS was first approved in Canada in 1993; about nine months later, GPS approach-capable avionics appeared on the market. The first WAAS unit is available now, but it needs an upgrade to LPV capability targeted for the end of 2003; other manufacturers will likely be offering similar capability by then. It is expected that there will be a good selection of LPV-capable panel-mount and flight management system (FMS) avionics available by mid-2004. NAV CANADA intends to work with aircraft operators on plans to provide WAAS-based approach procedures.



The high availability of WAAS service will allow NAV CANADA and our customers to start planning for a reduced dependence on ground aids. This planning will take into account the vulnerability of GPS and WAAS signals to interference, and the pace of aircraft equipage with WAAS avionics.