International Civil Aviation Organization
North American, Central American and Caribbean Office
Second North American, Central American and Caribbean Working Group Meeting (NACC/WG/2)
Ocho Rios, Jamaica, 12-16 May 2008

Agenda Item 3:   **CNS Developments**
                 3.6   Surveillance Data Exchange Activities

FEDERAL AVIATION ADMINISTRATION'S EXPERIENCE WITH RADAR DATA SHARING

(Presented by the United States of America)

SUMMARY

ICAO has previously identified surveillance data sharing as a key component for the harmonization of air traffic control systems in the CAR/SAM Region.

The attached briefing summarizes the Federal Aviation Administration's (FAA's) experience with radar data sharing.

Reference:
Ninth Meeting of the Civil Aviation Authorities of the SAM Region (Santiago, 18-20 April 2005);

1.   Introduction

1.1.   ICAO has previously identified surveillance data sharing as a key component for the harmonization of air traffic control systems in the CAR/SAM Region.

1.2.   The CAR/SAM Regional Planning and Implementation Group (GREPECAS) has adopted All Purpose Structured Eurocontrol Radar Information Exchange (ASTERIX) as the common data format for radar data exchange.

1.3.   The FAA currently uses Common Digitizer (CD) format for radar data but is planning for a decision by 2010 on implementing Internet Protocol (IP), including ASTERIX, as the standard for radar data. The FAA has been involved with radar data sharing for many years and was requested to share its experiences with members of the NACC Region.

2.   Discussion

2.1   The following areas of FAA's experience with radar data sharing are addressed in the briefing:

  a. Benefits
  b. Equipment Required
  c. Costs
  d. Technical and Operational Considerations
  e. Integration into Automation
  f. Details of Bilateral Agreement
  g. FAA Bilateral Agreements

3   **Conclusion**

3.1 Radar data sharing provides benefits to both States in a cost effective manner.

3.2 Until a common radar data format, such as ASTERIX, is implemented, additional effort is required during integration testing and certification and States are encouraged to work together to overcome any obstacles.

3.3 The required bilateral agreements take time to develop and negotiate but clearly define each State's responsibilities.
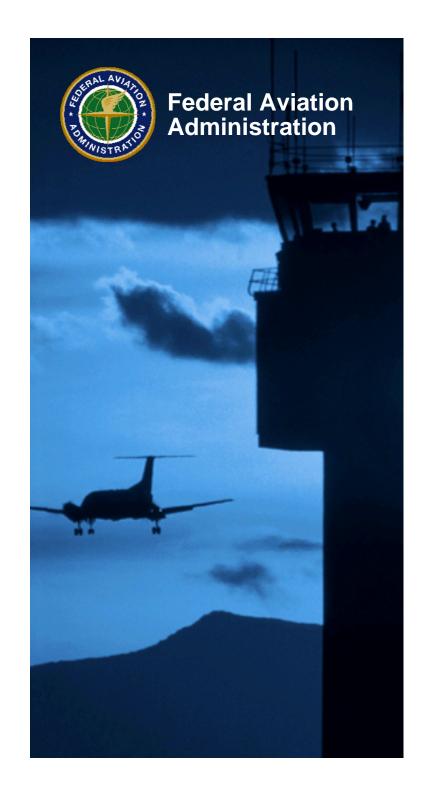
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United States Federal Aviation Administration

Experience With Radar Data Sharing

Presented to: NACC/WG/2, Ocho Rios, Jamaica

By: FAA Air Traffic Organization

Date: May 12-16, 2008

Federal Aviation Administration

Radar Data Sharing

- **Background**
- **Benefits**
- **Equipment Required**
- **Costs**
- **Technical/Operational Considerations**
- **Integration into Automation**
- **Details of Bilateral Agreement**
- **FAA Bilateral Agreements**
- **Conclusion**

Background

- **ICAO has previously identified surveillance data sharing as a key component for the harmonization of air traffic control systems in the CAR/SAM Region***

- **GREPECAS has adopted All Purpose Structured Eurocontrol Radar Information Exchange (ASTERIX) as the common data format for radar data exchange***

  - FAA currently uses Common Digitizer (CD) radar format but is planning for a decision by 2010 on implementing IP including ASTERIX for radar data

*Ninth Meeting of the Civil Aviation Authorities of the SAM Region (Santiago, 18-20 April 2005)

Benefits

- **Facilitates the safe and efficient hand-off of air traffic between Regions in a cost effective way**
- **Fills in coverage gaps where there previously was no radar coverage & allows operations using radar separation**
- **Provides a dedicated backup radar for en route & terminal operations & mitigates single thread for ATC operations**
- **Potential benefit to provide situational awareness or "extension of the controller's eyes"**

Equipment Required

- **Existing ATM automation system is used to process & display the radar targets**
- **Dedicated radar data circuits**
- **Radar data reformatter units**
  - Conversion to FAA's radar data format, Common Digitizer (CD), is required until a common radar format is implemented
- **Existing data recording and analysis equipment**

Costs

- **Non-recurring**
  - Radar data reformatter, including initial training
  - Dedicated data circuits
  - Installation materials
  - Man-hours for installation, integration, testing & certification

- **Recurring**
  - Dedicated data circuits – operation & maintenance
  - Radar data reformatter – operation & maintenance
  - Any additional training for radar data reformatter

Technical/Operational Considerations

- **Requirements for reliability, maintenance & availability**
- **Evaluation of radar characteristics & format**
  - Specification, interface requirements, & interface control documents identify any differences
- **Radar data circuits**
  - Determine bandwidth required for radar data
  - Single versus redundant or diverse circuits
  - Type of circuit to be used – satellite communication and/or terrestrial lines

Technical/Operational Considerations

- **Determine which targets are to be filtered for technical, operational, or security reasons**
- **Certification**
  - FAA certifies the radar service for operations using the same criteria applied to FAA systems
- **Coordination procedures & contingency plans for loss of service - maintenance and unscheduled**

Integration into Automation

- **Adapt ATM automation & reformatter unit**
- **Conduct data analysis & certification**
  - FAA's existing data analysis programs used
  - Additional effort required when radar type & format are different
- **Assign radar either as a primary or backup sensor in en route automation radar sort boxes (16 by 16 nautical miles)**
- **Also provides a dedicated backup to a terminal radar system (during maintenance and unscheduled service interruptions)**

Details of Bilateral Agreement*

- **Responsible party for installation, operation & maintenance costs**
  - The recipient of the radar data is usually responsible party
- **Agreed upon interface is identified, including the demarcation point**
- **What radar data is to be included/excluded**
- **Notice/coordination procedures for service interruption**
- **Key points of contact**
- **Liability coverage**

* Note that U.S. process typically includes an official State request before agreement is established.

FAA Bilateral Agreements

- **The Bahamas Department of Civil Aviation**
  - Nassau Secondary Surveillance Radar (SSR) data to Miami Air Route Traffic Control Center (ARTCC)

- **Bermuda Ministry of Aviation & Tourism**
  - SSR data to New York ARTCC

- **Nav Canada**
  - Current agreement includes 11 Canadian & 12 U.S. Sites
  - FAA currently uses data from 2 Canadian sites
    - Buffalo, NY Terminal Radar Approach Control uses data from Hamilton, Ontario
    - Anchorage ARTCC uses data from Sandspit (Cumshewa), British Columbia
  - Nav Canada currently uses data from 7 FAA sites

Conclusion

- **Radar data sharing provides benefits to both States in a cost effective manner**
- **Bilateral agreements**
  - Take time to develop & negotiate but clearly define each State's responsibilities
- **Until standard formats are implemented, additional effort is required during integration testing and certification and States are encouraged to work together to overcome any obstacles**