Agenda Item 6: Planning and Implementation Considerations

ATN ACTIVITIES IN JAPAN

(Presented by Japan)
ATN Activities in Japan

2000.3.27

JCAB
ATNIPC Overview
(ATN Implementation Planning Committee)

- Established at Aug. 1999
- Members of Committee
  - JCAB
  - Japan Major Airline (JAL, ANA, JAS)
  - Communication Provider
    - AVICOM, NTT, KDD
  - End Systems & ATS Systems Vendors
    - NEC, OKI, Melco, NTT-Data, Toshiba
  - Persons of wide experience as ATS
ATNIPC Objective

- Provide solutions to problems in ATN implementation
- Feasibility Study of ATN implementation
- Provide step-by-step Scenario of ATN implementation
- Provide ATN implementation Plan in Japan
- Final Report by 2001.1Q
ATN implementation Plan Report

- End of March, 2001 ATNIPC will issue “ATN implementation Plan Report”
- Volume.1 “Concept of introduction of ATN in Japan”
- Volume.2 “Infrastructure for ATN implementation”
CONTENTS OF VOLUME 1 (1)

• 1. Introduction of ATN Datalink Services
  – What is ATN?
  – Background
    • Traffic Volume, Current Datalink Services
    • FANS-1/A based ADS/CPDLC Trial in NOPAC
    • Datalink Services by MTSAT, HFDL, VDL/2, etc.
  – Datalink Services in ATN environment
  – Benefits of ATN implementation
CONTENTS OF VOLUME 1 (2)

• 2. Implementation of ATS Datalink Services
  – ICAO’s Concept
    • OPLINKP, ATMCP, etc.
    • ATS Datalink Application Manual (Doc. 9694)
  – Future Plan of CPDLC implementation by FAA, EUROCONTROL
    • BUILD 1, BUILD1A, BUILD2
    • PATAL2 Trial


CONTENTS OF VOLUME 1 (3)

• 2. Implementation of ATS Datalink Services
  – Implementation of ATS Datalink Services in Japan
    • Concept
      – Characteristics of Airspace, Operational Environment, Benefits, etc.
    • Datalink Services in Oceanic Airspace
      – A/G Communication (DCPC, CPDLC)
      – Surveillance (ADS-C)
      – D-FIS
    • Datalink Services in En-route (Land)/Terminal
      – Voice is Primary Mean
      – CPDLC Applied Routine & Non Time-Critical communication
      – D-FIS
CONTENTS OF VOLUME 1 (4)

- 2. Implementation of ATS Datalink Services
  - Reduce Separation Minima in Oceanic Airspace
    - 1st Step - 50/50 NM
    - 2nd Step - 30/30 NM
    - Mandatory of DCPC, CPDLC, ADS

<table>
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<tr>
<th>Separation Minima</th>
<th>Performance of Navigation</th>
<th>Maximum Interval of ADS periodic Reports</th>
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<tr>
<td>50 NM</td>
<td>RNP 10</td>
<td>27 min.</td>
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<tr>
<td></td>
<td>RNP 4</td>
<td>TBD</td>
</tr>
<tr>
<td>30 NM</td>
<td>RNP 4</td>
<td>14 min.</td>
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From Doc.4444 revised by RGCSP

- Mixtured Operation of ATN & FANS-1/A
CONTENTS OF VOLUME 1 (5)

• 2. Implementation of ATS Datalink Services
  – D-FIS
    • D-ATIS, Service for both ATN and ARINC620/623
    • Other Services(D-SIGMET, D-METAR, D-VOLMNET, etc.)
  – AIDC
    • Transition to ATN AIDC from APANPIRG AIDC
  – AMHS
    • Transition to AMHS from AFTN Circuit
  – ATS Datalink Implementation Plan
    • Target Year - 2007
3. Operational Scenario by ATN Datalink

4. Transition Step
   - Concept of Transition to ATN from FANS-1/A
   - Concept of Transition of AOC communication to ATN
   - Concept of Transition of Datalink/ATC ground Systems to ATN
   - Transition of Airborne Equipment & Airlines’ ground Systems to ATN
   - Transition of Datalink Service Provier’s System to ATN
   - Transition Costs
CONTENTS OF VOLUME 1 (7)

• 5. Trial
  – Clarification of Trial Phase
  – Objectives of each Trial phase
  – Environment of each Trial phase
CONTENTS OF VOLUME 1 (8)

Trial Phase and Environment

- Trial Phase
  a. ATN Protocol Test
  b. Connection Trial between A/G
  c. Operational Trial
  d. Operational Trial(included FANS-1/A)

- Other ATC

- Ground Systems

- ATN Airborne
  - HMI
  - ES
  - Airborne Router
  - SATCOM
  - VDL

- FANS-1/A airborne

- G/G Router

- ES

- G/G Router

- ES

- A/G Router

- Trial Phase and Environment (diagram)
CONTENTS OF VOLUME2 (1)
-Infrastructure for ATN implementation-

- 1. ATN Network Domain
   – Routing Architecture in Asia/Pacific Region
   – ATN Domain in Japan
   – Future Domain in Japan

- 2. Plan of ATN Naming & Addressing
   – ICAO’s SARPs & APANPIRG
   – Concept of addressing Plan
   – NSAP
   – Addressing in Japan
   – AMHS Naming
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• 3. Deployment of A/G Subnetwork
  – Guideline
  – VDL mode-2
    • AOA
    • ATN
  – MTSAT Data-3
  – INMARSAT Data-3
  – HFDL
  – Other A/G Subnetwork
4. Ground Network For ATN deployment

- Requirement for ATN
  - Performance, Integrity, Internetworking, etc.

- Guidelines for Internetworking
  - Applicable Protocol of Lower Layer
  - Feasibility Study of Applied IP Protocol to ATN in Local Region
  - Configuration of Ground Network
  - Transition
  - Security
  - Account

- AMHS
CONTENTS OF VOLUME2 (4)

• 5. Network Management
  – Definition of ATN SARP\text{s}
  – Directory Service
  – Feasibility Study of Total Network Management
  – Exchanging the network information by internetworking
  – Security Systems
CONTENTS OF VOLUME2 (5)

- 6. Implementation of ATN ground systems
  - Impacts to ATM systems by ATN systems
  - Standardization of the interface between ATN systems and ATM systems
    - CORBA, CPDLC Server (Including FANS-1/A), etc.
  - System Model of ATM & ATN
  - Future Requirements to ATM systems
  - Deployment and Location of ATN ES & ATN Router
  - Requirements to ATN ES
  - ATN system Configuration
System Model of ATM & ATN
ATM Center

- Ailines
  - Operation Center
  - IP Router

- ATM Center
  - ATMFS
  - DARPS
  - AFTN G/W
  - FPL DB
  - AIDC DB
  - DLP

- Other ACC

NSP

- IP Router
- VDL
- IP

ARTCC

- RDP
- AIM
- CPDLC Server
- IP Router

MTSAT GES Center

- CM ES
- CPDLC ES
- ADS ES
- AIDC ES

Terminal/Airport

- ARTS
- AIM
- CPDLC Server

ATN Network

ATM&ATN Configuration in Japan
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• Certification
  – Airborne Equipment
  – Ground Systems
    • Organization

• CCB
  – Relationship with FIT group