International Civil Aviation Organization

ATN Seminar and Third ATN Transition Task Force Meeting

Singapore, 26-30 March 2001

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**

Separation Minima	Performance of Navigation	Maximum Interval of ADS periodic Reports
50 NM	RNP 10	27min.
	RNP 4	TBD
30 NM	RNP 4	14 min.

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-VOLMET, etc.)**
  - **AIDC**
    - **Transition to ATN AIDC from APANPIRG AIDC**
  - **AMHS**
    - **Transition to AMHS from AFTN Circuit**
  - **ATS Datalink Implementation Plan**
    - **Target Year - 2007**
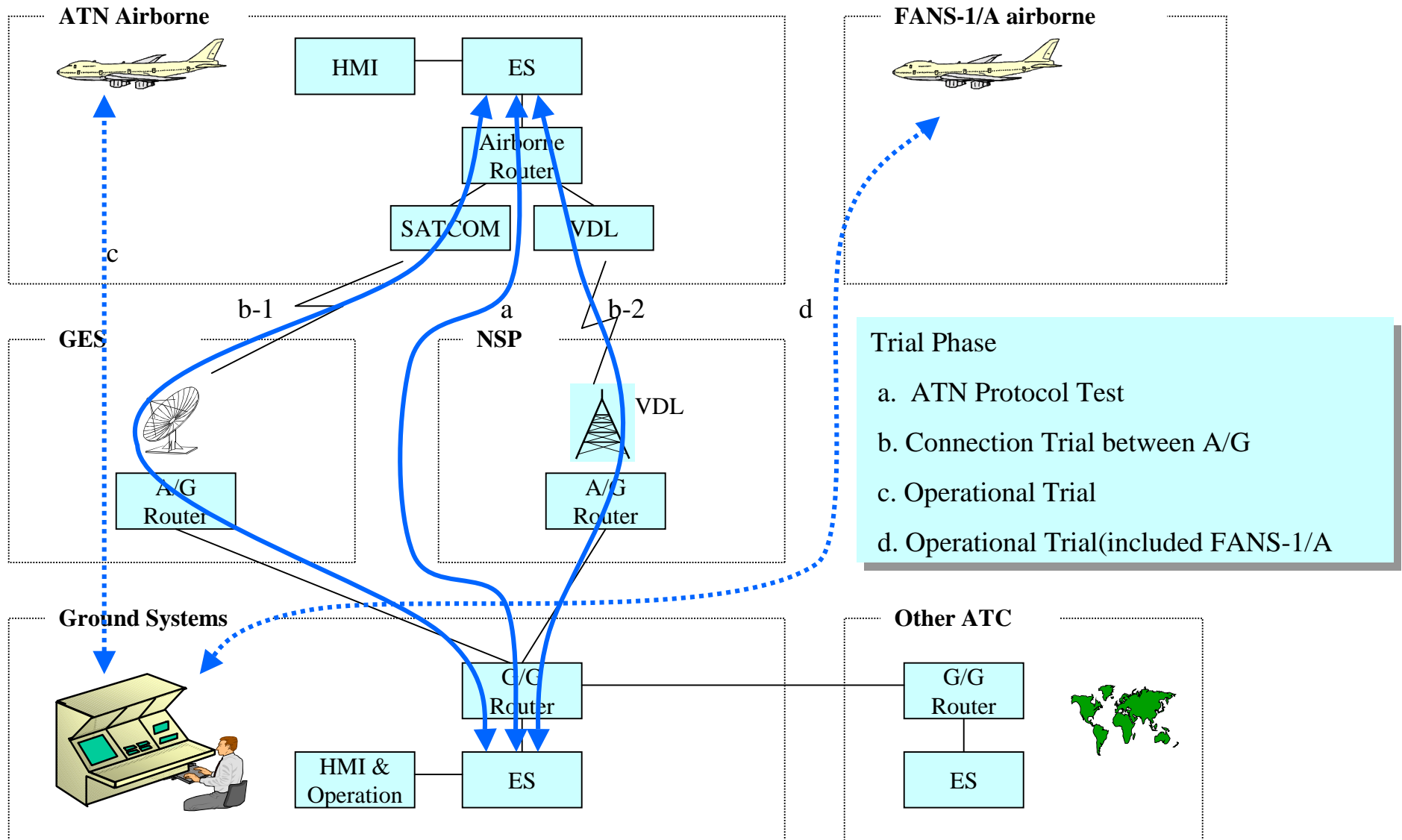
CONTENTS OF VOLUME 1 (6)

- **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

ATN Airborne

FANS-1/A airborne

HMI — ES

Airborne Router

SATCOM   VDL

c

b-1   a   b-2   d

GES   **NSP**

VDL

A/G Router   A/G Router

Trial Phase

a. ATN Protocol Test

b. Connection Trial between A/G

c. Operational Trial

d. Operational Trial(included FANS-1/A

Ground Systems   **Other ATC**

G/G Router   G/G Router

HMI & Operation — ES   ES

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

CONTENTS OF VOLUME2 (2)

- **3. Deployment of A/G Subnetwork**
  - **Guideline**
  - **VDL mode-2**
    - **AOA**
    - **ATN**
  - **MTSAT Data-3**
  - **INMARSAT Data-3**
  - **HFDL**
  - **Other A/G Subnetwork**

CONTENTS OF VOLUME2 (3)

- 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
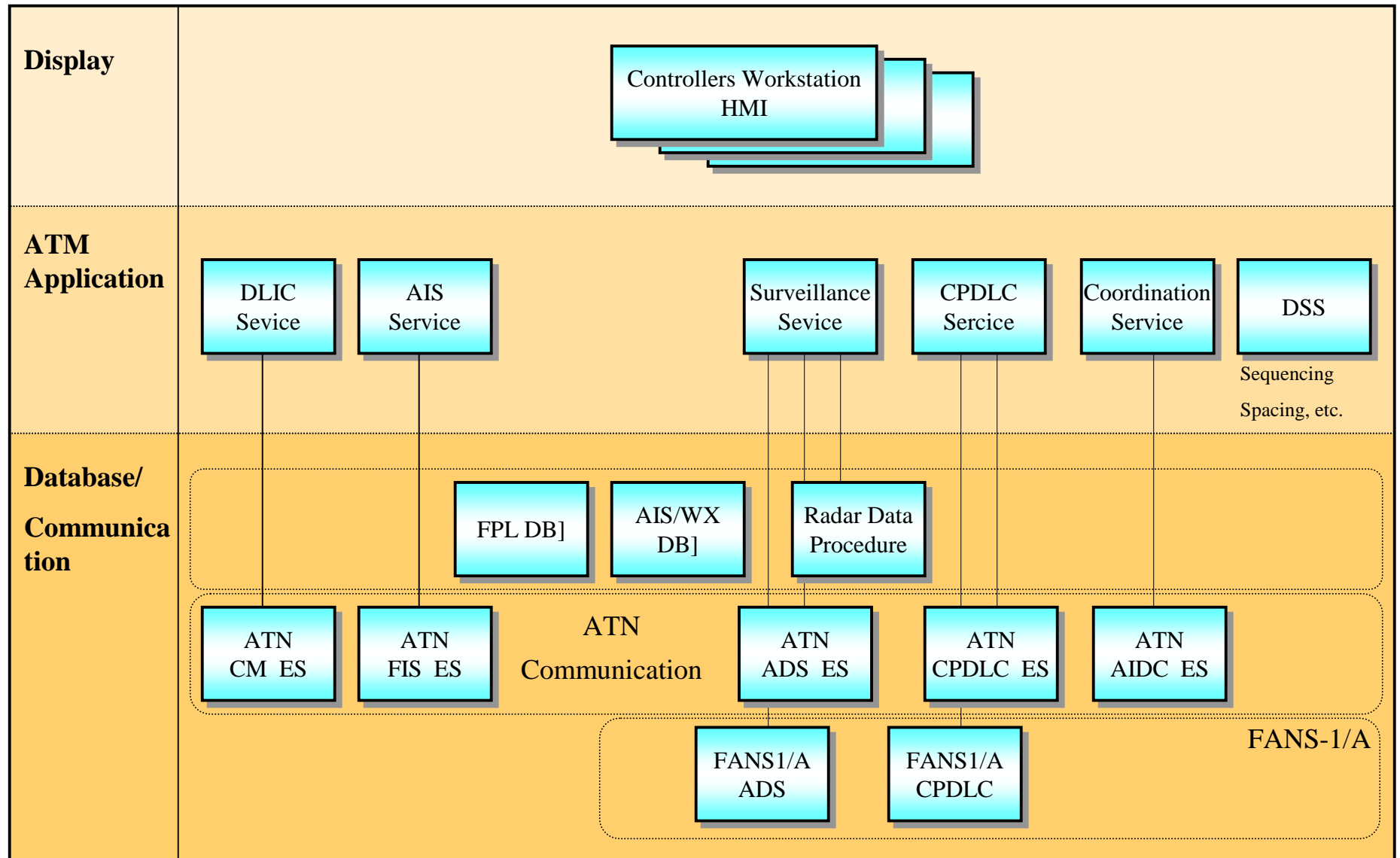   - Security
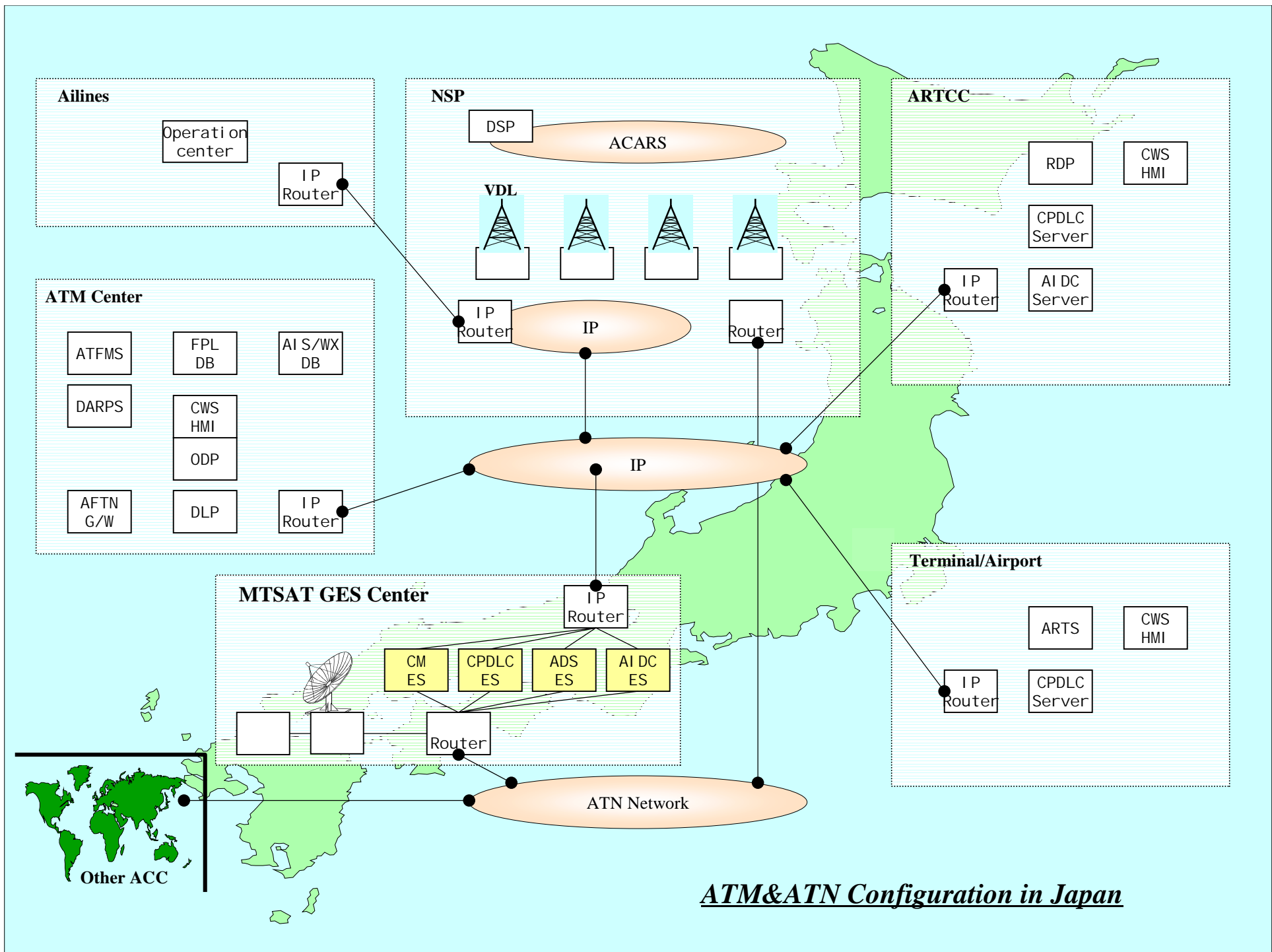   - Account
  - AMHS

CONTENTS OF VOLUME2 (4)

- 5. Network Management
  - Definition of ATN SARPs
  - 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

Display	Controllers Workstation HMI
ATM Application	DLIC Sevice · AIS Service · Surveillance Sevice · CPDLC Sercice · Coordination Service · DSS (Sequencing Spacing, etc.)
Database/ Communication	FPL DB] · AIS/WX DB] · Radar Data Procedure · ATN Communication · ATN CM ES · ATN FIS ES · ATN ADS ES · ATN CPDLC ES · ATN AIDC ES · FANS1/A ADS · FANS1/A CPDLC · FANS-1/A

ATM&ATN Configuration in Japan

CONTENTS OF VOLUME2 (6)

- Certification
  - Airborne Equipment
  - Ground Systems
    - Organization

- CCB
  - Relationship with FIT group