Appendice 1 al Regolamento ENAC ATSEP
Basic training — Shared

Subject 1: INDUCTION

TOPIC 1 BASIND — Induction

Sub-topic 1.1 BASIND — Training and Assessment Overview
Sub-topic 1.2 BASIND — National Organisation

Sub-topic 1.3 BASIND — Workplace
Sub-topic 1.4 BASIND — ATSEP role

Sub-topic 1.5 BASIND — European/Worldwide Dimension

Sub-topic 1.6 BASIND — International Standards and Recommended Practices
Sub-topic 1.7 BASIND — Data Security

Sub-topic 1.8 BASIND — Quality Management Sub-
topic 1.9 BASIND — Safety Management System
Sub-topic 1.10 BASIND — Health and Safety

Subject 2: AIR TRAFFIC FAMILIARISATION

TOPIC 1 BASATF — Air Traffic Familiarisation

Sub-topic 1.1 BASATF — Air Traffic Management
Sub-topic 1.2 BASATF — Air Traffic Control Sub-
topic 1.3 BASATF — Ground-based Safety Nets

Sub-topic 1.4 BASATF — Air Traffic Control Tools and Monitoring Aids
Sub-topic 1.5 BASATF — Familiarisation

Appendice 2 al Regolamento ENAC ATSEP
Basic training — Streams

Subject 3: AERONAUTICAL INFORMATION SERVICES

Subject 4: METEOROLOGY

Subject 5: COMMUNICATION

Subject 6: NAVIGATION

Subject 7: SURVEILLANCE

Subject 8: DATA PROCESSING

Subject 9: SYSTEM MONITORING & CONTROL

Subject 10: MAINTENANCE PROCEDURES

Appendice 3 al Regolamento ENAC ATSEP
Qualification training — Shared

Subject 1: SAFETY

TOPIC 1 — Safety Management

Sub-topic 1.1 — Policy and Principles

Sub-topic 1.2 — Concept of Risk and Principles of Risk Assessment Sub-topic 1.3 — Safety Assessment Process

Sub-topic 1.4 — Air Navigation System Risk Classification Scheme
Sub-topic 1.5 — Safety Regulation

Subject 2: HEALTH AND SAFETY

TOPIC 1 — Hazard Awareness and Legal Rules

Sub-topic 1.1 — Hazard Awareness

Sub-topic 1.2 — Regulations and Procedures

Sub-topic 1.3 — Handling of Hazardous Material

Subject 3: HUMAN FACTORS

TOPIC 1 — Introduction to Human Factors

Sub-topic 1.1 — Introduction

TOPIC 2 — Working Knowledge and Skills

Sub-topic 2.1 — ATSEP knowledge, skills and competence

TOPIC 3 — Psychological Factors

Sub-topic 3.1 — Cognition

TOPIC 4 — Medical

Sub-topic 4.1 — Fatigue

Sub-topic 4.2 — Fitness

Sub-topic 4.3 — Work Environment

TOPIC 5 — Organisational and Social Factors

Sub-topic 5.1 — Basic Needs of People at Work

Sub-topic 5.2 — Team Resource Management

Sub-topic 5.3 — Teamwork and Team Roles

TOPIC 6 — Communication

Sub-topic 6.1 — Written Report

Sub-topic 6.2 — Verbal and Non-verbal Communication

TOPIC 7 — Stress

Sub-topic 7.1 — Stress

Sub-topic 7.2 — Stress Management

TOPIC 8 — Human Error

Sub-topic 8.1 — Human Error

Appendice 4 al Regolamento ENAC ATSEP
Qualification training — Streams

1. COMMUNICATION — VOICE

Subject 1: VOICE

TOPIC 1 — Air-Ground

Sub-topic 1.1 — Transmission/Reception
Sub-topic 1.2 — Radio Antenna Systems
Sub-topic 1.3 — Voice Switch
Sub-topic 1.4 — Controller Working Position
Sub-topic 1.5 — Radio Interfaces

TOPIC 2 — COMVCE — Ground-Ground

Sub-topic 2.1 — Interfaces
Sub-topic 2.2 — Protocols
Sub-topic 2.3 — Switch
Sub-topic 2.4 — Communication chain
Sub-topic 2.5 — Controller working position

Subject 2: TRANSMISSION PATH

TOPIC 1 — Lines

Sub-topic 1.1 — Lines Theory
Sub-topic 1.2 — Digital Transmissions
Sub-topic 1.3 — Types of Lines

TOPIC 2 — Specific Links

Sub-topic 2.1 — Microwave Link
Sub-topic 2.2 — Satellite

Subject 3: RECORDERS

TOPIC 1 — Legal Recorders

Sub-topic 1.1 — Regulations
Sub-topic 1.2 — Principles

Subject 4: FUNCTIONAL SAFETY

TOPIC 1 — Safety Attitude

Sub-topic 1.1 — Safety Attitude

TOPIC 2 — Functional Safety

Sub-topic 2.1 — Functional safety

2. COMMUNICATION — DATA

Subject 1: DATA

TOPIC 1 — Introduction to Networks

Sub-topic 1.1 — Types
Sub-topic 1.2 — Networks
Sub-topic 1.3 — External Network Services
Sub-topic 1.4 — Measuring Tools
Sub-topic 1.5 — Troubleshooting

TOPIC 2 — Protocols

Sub-topic 2.1 — Fundamental Theory
Sub-topic 2.2 — General Protocols
Sub-topic 3.3 — Specific Protocols

TOPIC 3 — National Networks

Sub-topic 3.1 — National Networks

TOPIC 4 — European Networks

Sub-topic 4.1 — Network Technologies

TOPIC 5 — Global Networks

Sub-topic 5.1 — Networks and
Standards Sub-topic 5.2 — Description

Sub-topic 5.3 — Global Architecture Sub-
topic 5.4 — Air-Ground Sub-Networks

Sub-topic 5.5 — Ground-Ground Sub-Networks
Sub-topic 5.6 — Networks on Board of the
Aircraft Sub-topic 5.7 — Air-Ground Applications

Subject 2: TRANSMISSION PATH

TOPIC 1 — Lines

Sub-topic 1.1 — Lines Theory
Sub-topic 1.2 — Digital Transmission
Sub-topic 1.3 — Types of Lines

TOPIC 2 — Specific Links

Sub-topic 2.1 — Microwave Link
Sub-topic 2.2 — Satellite

Subject 3: RECORDERS

TOPIC 1 — Legal Recorders

Sub-topic 1.1 — Regulations
Sub-topic 1.2 — Principles

Subject 4: FUNCTIONAL SAFETY

TOPIC 1 — Safety Altitude

Sub-topic 1.1 — Safety Attitude

TOPIC 2 — Functional Safety

Sub-topic 2.1 — Functional Safety

3. NAVIGATION — NON-DIRECTIONAL BEACON (NDB)

Subject 1: PERFORMANCE-BASED NAVIGATION

TOPIC 1 — Navigation Concepts

Sub-topic 1.1 — Operational Requirements
Sub-topic 1.2 — Performance-based Navigation
Sub-topic 1.3 — Area Navigation Concept (RNAV)
Sub-topic 1.4 — NOTAM

Subject 2: GROUND-BASED SYSTEMS — NDB

TOPIC 1 — NDB/Locator

Sub-topic 1.1 — Use of the System
Sub-topic 1.2 — Ground Station Architecture
Sub-topic 1.3 — Transmitter Sub-system
Sub-topic 1.4 — Antenna Sub-system
Sub-topic 1.5 — Monitoring and Control Sub-systems
Sub-topic 1.6 — On-board Equipment
Sub-topic 1.7 — System Check and Maintenance

Subject 3: GLOBAL NAVIGATION SATELLITE SYSTEM

TOPIC 1 — GNSS

Sub-topic 1.1 — General View

Subject 4: ON-BOARD EQUIPMENT

TOPIC 1 — On-board Systems

Sub-topic 1.1 — On-board Systems

TOPIC 2 — Autonomous Navigation

Sub-topic 2.1 — Inertial Navigation

TOPIC 3 — Vertical Navigation

Sub-topic 3.1 — Vertical Navigation

Subject 5: FUNCTIONAL SAFETY

TOPIC 1 — Safety Attitude

Sub-topic 1.1 — Safety Attitude

TOPIC 2 — Functional Safety

Sub-topic 1.1 — Functional Safety

4. NAVIGATION — DIRECTION FINDING (DF)

Subject 1: PERFORMANCE-BASED NAVIGATION

TOPIC 1 — Navigation Concepts

Sub-topic 1.1 — Operational Requirements
Sub-topic 1.2 — Performance-Based Navigation
Sub-topic 1.3 — Area Navigation Concept (RNAV)
Sub-topic 1.4 — NOTAM

Subject 2: GROUND-BASED SYSTEMS — DF

TOPIC 1 — DF

Sub-topic 1.1 — Use of the System
Sub-topic 1.2 — VDF/DDF Equipment Architecture
Sub-topic 1.3 — Receiver Sub-system
Sub-topic 1.4 — Antenna Sub-system
Sub-topic 1.5 — Monitoring and Control Sub-systems
Sub-topic 1.6 — System Check and Maintenance

Subject 3: GLOBAL NAVIGATION SATELLITE SYSTEM

TOPIC 1 — GNSS

Sub-topic 1.1 — General View

Subject 4: ON-BOARD EQUIPMENT

TOPIC 1 — On-board Systems

Sub-topic 1.1 — On-board Systems

TOPIC 2 — Autonomous Navigation

Sub-topic 2.1 — Inertial Navigation

TOPIC 3 — Vertical Navigation

Sub-topic 3.1 — Vertical Navigation

Subject 5: FUNCTIONAL SAFETY

TOPIC 1 — Safety Attitude

Sub-topic 1.1 — Safety Attitude

TOPIC 2 — Functional Safety

Sub-topic 2.1 — Functional Safety

5. NAVIGATION — VHF OMNIDIRECTIONAL RADIO RANGE (VOR)

Subject 1: PERFORMANCE-BASED NAVIGATION

TOPIC 1 — Navigation Concepts

Sub-topic 1.1 — Operational Requirements
Sub-topic 1.2 — Performance-Based Navigation
Sub-topic 1.3 — Area Navigation Concept (RNAV)
Sub-topic 1.4 — NOTAM

Subject 2: GROUND-BASED SYSTEMS — VOR

TOPIC 1 — VOR

Sub-topic 1.1 — Use of the System
Sub-topic 1.2 — Fundamentals of CVOR and/or DVOR
Sub-topic 1.3 — Ground Station Architecture
Sub-topic 1.4 — Transmitter Sub-system
Sub-topic 1.5 — Antenna Sub-system
Sub-topic 1.6 — Monitoring and Control Sub-system
Sub-topic 1.7 — On-board Equipment
Sub-topic 1.8 — System Check and Maintenance

Subject 3: GLOBAL NAVIGATION SATELLITE SYSTEM

TOPIC 1 — GNSS

Sub-topic 1.1 — General View

Subject 4: ON-BOARD EQUIPMENT

TOPIC 1 — On-board Systems

Sub-topic 1.1 — On-board Systems

TOPIC 2 — Autonomous Navigation

Sub-topic 2.1 — Inertial Navigation

TOPIC 3 — Vertical Navigation

Sub-topic 3.1 — Vertical Navigation

Subject 5: — FUNCTIONAL SAFETY

TOPIC 1 — Safety Attitude

Sub-topic 1.1 — Safety Attitude

TOPIC 2 — Functional Safety

Sub-topic 2.1 — Functional Safety

6. NAVIGATION — DISTANCE MEASURING EQUIPMENT (DME)

Subject 1: PERFORMANCE-BASED NAVIGATION

TOPIC 1 — Navigation concepts

Sub-topic 1.1 — Operational Requirements
Sub-topic 1.2 — Performance-Based Navigation
Sub-topic 1.3 — Area Navigation Concept (RNAV)
Sub-topic 1.4 — NOTAM

Subject 2: GROUND-BASED SYSTEMS — DME

TOPIC 1 — DME

Sub-topic 1.1 — Use of the System
Sub-topic 1.2 — Fundamentals of DME
Sub-topic 1.3 — Ground Station Architecture
Sub-topic 1.4 — Receiver Sub-system
Sub-topic 1.5 — Signal Processing
Sub-topic 1.6 — Transmitter Sub-system
Sub-topic 1.7 — Antenna Sub-system
Sub-topic 1.8 — Monitoring and Control Sub-system
Sub-topic 1.9 — On-board Equipment
Sub-topic 1.10 — System Check and Maintenance

Subject 3: GLOBAL NAVIGATION SATELLITE SYSTEM

TOPIC 1 — GNSS

Sub-topic 1.1 — General View

Subject 4: ON-BOARD EQUIPMENT

TOPIC 1 — On-board Systems

Sub-topic 1.1 — On-board Systems

TOPIC 2 — Autonomous Navigation

Sub-topic 2.1 — Inertial Navigation

TOPIC 3 Vertical Navigation

Sub-topic 3.1 — Vertical Navigation

Subject 5: FUNCTIONAL SAFETY

TOPIC 1 — Safety Attitude

Sub-topic 1.1 — Safety Attitude

TOPIC 2 — Functional Safety

Sub-topic 2.1 — Functional Safety

7. NAVIGATION — INSTRUMENT LANDING SYSTEM (ILS)

Subject 1: PERFORMANCE-BASED NAVIGATION

TOPIC 1 — Navigation concepts

Sub-topic 1.1 — Operational Requirements
Sub-topic 1.2 — Performance-Based Navigation
Sub-topic 1.3 — Area Navigation Concept (RNAV)
Sub-topic 1.4 — NOTAM

Subject 2: GROUND-BASED SYSTEMS — ILS

TOPIC 1 — ILS

Sub-topic 1.1 — Use of the System
Sub-topic 1.2 — Fundamentals of ILS
Sub-topic 1.3 — 2F-Systems
Sub-topic 1.4 — Ground Station Architecture
Sub-topic 1.5 — Transmitter Sub-system
Sub-topic 1.6 — Antenna Sub-system
Sub-topic 1.7 — Monitoring and Control Sub-system
Sub-topic 1.8 — On-board Equipment
Sub-topic 1.9 — System Check and Maintenance

Subject 3: GLOBAL NAVIGATION SATELLITE SYSTEM

TOPIC 1 — GNSS

Sub-topic 1.1 — General View

Subject 4: ON-BOARD EQUIPMENT

TOPIC 1 — On-board Systems

Sub-topic 1.1 — On-board Systems

TOPIC 2 — Autonomous navigation

Sub-topic 2.1 — Inertial Navigation

TOPIC 3 — Vertical Navigation

Sub-topic 3.1 — Vertical Navigation

Subject 5: FUNCTIONAL SAFETY

TOPIC 1 — Safety Attitude

Sub-topic 1.1 — Safety Attitude

TOPIC 2 — Functional Safety

Sub-topic 2.1 — Functional Safety

Subject 1: PERFORMANCE-BASED NAVIGATION

TOPIC 1 — Navigation Concepts

Sub-topic 1.1 — Operational Requirements
Sub-topic 1.2 — Performance-Based Navigation
Sub-topic 1.3 — Area Navigation Concept (RNAV)
Sub-topic 1.4 — NOTAM

Subject 2: GROUND-BASED SYSTEMS — MLS

TOPIC 1 — MLS

Sub-topic 1.1 — Use of the System
Sub-topic 1.2 — Fundamentals of MLS
Sub-topic 1.3 — Ground Station Architecture
Sub-topic 1.4 — Transmitter Sub-system
Sub-topic 1.5 — Antenna Sub-system
Sub-topic 1.6 — Monitoring and Control Sub-system
Sub-topic 1.7 — On-board Equipment
Sub-topic 1.4 — System Check and Maintenance

Subject 3: GLOBAL NAVIGATION SATELLITE SYSTEM

TOPIC 1 — GNSS

Sub-topic 1.1 — General View

Subject 4: ON-BOARD EQUIPMENT

TOPIC 1 — On-board Systems

Sub-topic 1.1 — On-board Systems

TOPIC 2 — Autonomous navigation

Sub-topic 2.1 — Inertial Navigation

TOPIC 3 — Vertical navigation

Sub-topic 3.1 — Vertical Navigation

Subject 5: FUNCTIONAL SAFETY

TOPIC 1 — Safety attitude

Sub-topic 1.1 — Safety Attitude

TOPIC 2 — Functional safety

Sub-topic 2.1 — Functional Safety

9. SURVEILLANCE — PRIMARY SURVEILLANCE RADAR

Subject 1: PRIMARY SURVEILLANCE RADAR

TOPIC 1 — ATC surveillance

Sub-topic 1.1 — Use of PSR for Air Traffic Services
Sub-topic 1.2 — Antenna (PSR)
Sub-topic 1.3 — Transmitters
Sub-topic 1.4 — Characteristics of Primary Targets
Sub-topic 1.5 — Receivers
Sub-topic 1.6 — Signal Processing and Plot Extraction
Sub-topic 1.7 — Plot Combining
Sub-topic 1.8 — Characteristics of Primary Radar

TOPIC 2 — SURPSR — Surface Movement Radar

Sub-topic 2.1 — Use of SMR for Air Traffic Services
Sub-topic 2.2 — Radar Sensor

TOPIC 3 — SURPSR — Test and Measurement

Sub-topic 3.1 — Test and Measurement

Subject 2: HUMAN MACHINE INTERFACE (HMI)

TOPIC 1 — SURPSR — HMI

Sub-topic 1.1 — ATCO HMI
Sub-topic 1.2 — ATSEP HMI
Sub-topic 1.3 — Pilot HMI
Sub-topic 1.4 — Displays

Subject 3: SURVEILLANCE DATA TRANSMISSION

TOPIC 1 — SDT

Sub-topic 1.1 — Technology and Protocols
Sub-topic 1.2 — Verification Methods

Subject 4: FUNCTIONAL SAFETY

TOPIC 1 — SURPSR — Safety Attitude

Sub-topic 1.1 — Safety Attitude

TOPIC 2 — SURPSR — Functional Safety

Sub-topic 2.1 — Functional Safety

Subject 5: DATA PROCESSING SYSTEMS

TOPIC 1 — System Components

Sub-topic 1.1 — Surveillance Data Processing Systems

Subject 1: SECONDARY SURVEILLANCE RADAR (SSR)

TOPIC 1 — SSR and Mono-pulse SSR

Sub-topic 1.1 — Use of SSR for Air Traffic Services
Sub-topic 1.2 — Antenna (SSR)
Sub-topic 1.3 — Interrogator
Sub-topic 1.4 — Transponder
Sub-topic 1.5 — Receivers
Sub-topic 1.6 — Signal Processing and Plot Extraction
Sub-topic 1.7 — Plot Combining
Sub-topic 1.8 — Test and Measurement

TOPIC 2 — Mode S

Sub-topic 2.1 — Introduction to Mode S
Sub-topic 2.2 — Mode S System

TOPIC 3 — Multilateration

Sub-topic 3.1 — MLAT in use
Sub-topic 3.2 — MLAT Principles

TOPIC 4 — SURSSR — Environment

Sub-topic 4.1 — SSR Environment

Subject 2: HUMAN MACHINE INTERFACE (HMI)

TOPIC 1 — HMI

Sub-topic 1.1 — ATCO HMI
Sub-topic 1.2 — ATSEP HMI
Sub-topic 1.3 — Pilot HMI
Sub-topic 1.1 — Displays

Subject 3: SURVEILLANCE DATA TRANSMISSION

TOPIC 1 — SDT

Sub-topic 1.1 — Technology and Protocols
Sub-topic 1.2 — Verification Methods

Subject 4: FUNCTIONAL SAFETY

TOPIC 1 — Safety attitude

Sub-topic 1.1 — Safety Attitude

TOPIC 2 — Functional safety

Sub-topic 2.1 — Functional Safety

Subject 5: DATA PROCESSING SYSTEMS

TOPIC 1 — System components

Sub-topic 1.1 — Surveillance Data Processing Systems

11. SURVEILLANCE — AUTOMATIC DEPENDENT SURVEILLANCE

Subject 1: AUTOMATIC DEPENDENT SURVEILLANCE (ADS)

TOPIC 1 — General view on ADS

Sub-topic 1.1 — Definition of ADS

TOPIC 2 — SURADS — ADS-B

Sub-topic 2.1 — Introduction to ADS-B
Sub-topic 2.2 — Techniques of ADS-B
Sub-topic 2.3 — VDL Mode 4 (STDMA)
Sub-topic 2.4 — Mode S Extended Squitter
Sub-topic 2.5 — UAT
Sub-topic 2.6 — ASTERIX

TOPIC 3 — ADS-C

Sub-topic 3.1 — Introduction to ADS-C
Sub-topic 3.2 — Techniques in ADS-C

Subject 2: HUMAN MACHINE INTERFACE (HMI)

TOPIC 1 — HMI

Sub-topic 1.1 — ATCO HMI
Sub-topic 1.2 — ATSEP HMI
Sub-topic 1.3 — Pilot HMI
Sub-topic 1.1 — Displays

Subject 3: SURVEILLANCE DATA TRANSMISSION

TOPIC 1 — SDT

Sub-topic 1.1 — Technology and Protocols
Sub-topic 1.2 — Verification Methods

Subject 4: FUNCTIONAL SAFETY

TOPIC 1 — Safety Attitude

Sub-topic 1.1 — Safety Attitude

TOPIC 2 — SURADS — Functional Safety

Sub-topic 2.1 — Functional Safety

Subject 5: DATA PROCESSING SYSTEMS

TOPIC 1 — System components

Sub-topic 1.1 — Surveillance Data Processing Systems

12. DATA — DATA PROCESSING

Subject 1: FUNCTIONAL SAFETY

TOPIC 1 — Functional Safety

Sub-topic 1.1 — Functional Safety

Sub-topic 1.2 — Software Integrity and Security

TOPIC 2 — Safety Attitude

Sub-topic 2.1 — Safety Attitude

Subject 2: DATA PROCESSING SYSTEMS

TOPIC 1 — User requirements

Sub-topic 1.1 — Controller requirements

Sub-topic 1.2 — Trajectories, Prediction and Calculation Sub-topic 1.3 — Ground Safety Nets

Sub-topic 1.4 — Decision Support

TOPIC 2 — System Components Data

Sub-topic 2.1 — Processing Systems

Sub-topic 2.2 — Flight Data Processing Systems Sub-topic 2.3 — Surveillance Data Processing Systems

Subject 3: DATA PROCESS

TOPIC 1 — Software process

Sub-topic 1.1 — Middleware

Sub-topic 1.2 — Operating Systems

Sub-topic 1.3 — Configuration Control

Sub-topic 1.4 — Software Development Process

TOPIC 2 — Hardware platform

Sub-topic 2.1 — Equipment Upgrade

Sub-topic 2.2 — COTS

Sub-topic 2.3 — Interdependence

Sub-topic 2.4 — Maintainability

TOPIC 3 — Testing

Sub-topic 3.1 — Testing

Subject 4: DATA

TOPIC 1 — Data Essential Features

Sub-topic 1.1 — Data Significance

Sub-topic 1.2 — Data Configuration Control

Sub-topic 1.3 — Data Standards

TOPIC 2 — ATM Data — Detailed structure

Sub-topic 2.1 — System Area Sub-
topic 2.2 — Characteristic Points Sub-
topic 2.3 — Aircraft Performances
Sub-topic 2.4 — Screen Manager

Sub-topic 2.5 — Auto-coordination Messages
Sub-topic 2.6 — Configuration Control Data
Sub-topic 2.7 — Physical Configuration Data
Sub-topic 2.8 — Relevant Meteo Data

Sub-topic 2.9 — Alert and Error Messages to ATSEP
Sub-topic 2.10 — Alert and Error Messages to ATCO

Subject 5: COMMUNICATION DATA

TOPIC 1 — Introduction to Networks

Sub-topic 1.1 — Types
Sub-topic 1.2 — Networks
Sub-topic 1.3 — External Network Services
Sub-topic 1.4 — Measuring Tools
Sub-topic 1.5 — Troubleshooting

TOPIC 2 — Protocols

Sub-topic 2.1 — Fundamental Theory
Sub-topic 2.2 — General Protocols
Sub-topic 2.3 — Specific Protocols

TOPIC 3 — DATDP — National Networks

Sub-topic 3.1 — National Networks

Subject 6: SURVEILLANCE PRIMARY

TOPIC 1 — ATC Surveillance

Sub-topic 1.1 — Use of PSR for Air Traffic Services

Subject 7: SURVEILLANCE SECONDARY

TOPIC 1 — SSR AND MSSR

Sub-topic 1.1 — Use of SSR for Air Traffic Services

TOPIC 2 — Mode S

Sub-topic 2.1 — Introduction to Mode S

TOPIC 3 — Multilateration

Sub-topic 3.1 — MLAT Principles

Subject 8: SURVEILLANCE — HMI

TOPIC 1 — HMI

Sub-topic 1.1 — ATCO HMI

Subject 9: SURVEILLANCE DATA TRANSMISSION

TOPIC 1 — Surveillance Data Transmission

Sub-topic 1.1 — Technology and Protocols

13. SYSTEM MONITORING AND CONTROL — COMMUNICATION

Subject 1: ANS STRUCTURE

TOPIC 1 — ANSP Organisation and Operation

Sub-topic 1.1 — SMCCOM — ANSP Organisation and Operation

TOPIC 2 — ANSP Maintenance Program

Sub-topic 2.1 — Policy

TOPIC 3 — ATM Context

Sub-topic 3.1 — ATM Context

TOPIC 4 — ANSP Administrative Practices

Sub-topic 4.1 — Administration

Subject 2: ANS SYSTEM/EQUIPMENT

TOPIC 1 — Operational Impacts

Sub-topic 1.1— Degradation or Loss of System/Equipment Services

TOPIC 2 — SMCCOM — User Position Functionality and Operation

Sub-topic 2.1 — User Working Position

Sub-topic 2.2 — SMC Working Position

Subject 3: TOOLS, PROCESSES AND PROCEDURES

TOPIC 1 — Requirements

Sub-topic 1.1 — SMS

Sub-topic 1.2 — QMS

Sub-topic 1.3 — SMS application in the working environment

TOPIC 2 — Maintenance Agreements with Outside Agencies

Sub-topic 2.1 — Principles of agreements

TOPIC 3 — SMC General Processes

Sub-topic 3.1 — Roles and responsibilities

TOPIC 4 — Maintenance Management Systems

Sub-topic 4.1 — Reporting

Subject 4: TECHNOLOGY

TOPIC 1 — Technologies and Principles

Sub-topic 1.1 — General
Sub-topic 1.2 — Communication
Sub-topic 1.3 — Facilities

Subject 5: COMMUNICATION VOICE

TOPIC 1 — Air-Ground

Sub-topic 1.1 — Controller Working Position

TOPIC 2 — Ground-Ground

Sub-topic 2.1 — Interfaces
Sub-topic 2.2 — Switch
Sub-topic 2.3 — Controller Working Position

Subject 6: COMMUNICATION — DATA

TOPIC 1 — European Networks

Sub-topic 1.1 — Network Technologies

TOPIC 2 — Global Networks

Sub-topic 2.1 — Networks and Standards
Sub-topic 2.2 — Description
Sub-topic 2.3 — Global Architecture
Sub-topic 2.4 — Air-Ground Sub-networks
Sub-topic 2.5 — Ground-Ground Sub-networks
Sub-topic 2.6 — Air-Ground Applications

Subject 7: COMMUNICATION — RECORDERS

TOPIC 1 —Legal recorders

Sub-topic 1.1 — Regulations
Sub-topic 1.2 — Principles

Subject 8: NAVIGATION — PBN NDB

TOPIC 1 — NAV Concepts

Sub-topic 1.1 — NOTAM

14. SYSTEM MONITORING AND CONTROL — NAVIGATION

Subject 1: ANS STRUCTURE

TOPIC 1 — ANSP Organisation and Operation

Sub-topic 1.1 — ANSP Organisation and Operation

TOPIC 2 — ANSP Maintenance Program

Sub-topic 2.1 — Policy

TOPIC 3 — ATM Context

Sub-topic 3.1 — ATM Context

TOPIC 4 — ANSP Administrative Practices

Sub-topic 4.1 — Administration

Subject 2: ANS SYSTEM/EQUIPMENT

TOPIC 1 — Operational Impacts

Sub-topic 1.1 — SMCNAV — Degradation or Loss of System/Equipment Services

TOPIC 2 — User Position Functionality and Operation

Sub-topic 2.1 — User Working Position

Sub-topic 2.2 — SMC Working Position

Subject 3: TOOLS, PROCESSES AND PROCEDURES

TOPIC 1 — SMCNAV — Requirements

Sub-topic 1.1 — SMS

Sub-topic 1.2 — QMS

Sub-topic 1.3 — SMS application in the working environment

TOPIC 2 — Maintenance Agreements with Outside Agencies

Sub-topic 2.1 — Principles of agreements

TOPIC 3 — SMC General Processes

Sub-topic 3.1 — Roles and responsibilities

TOPIC 4 — SMCNAV — Maintenance Management Systems

Sub-topic 4.1 — Reporting

Subject 4: TECHNOLOGY

TOPIC 1 — SMCNAV — Technologies and Principles

Sub-topic 1.1 — General

Sub-topic 1.2 — Communication

Sub-topic 1.3 — Facilities

Subject 5: COMMUNICATION — DATA

TOPIC 1 — SMCNAV — European Networks

Sub-topic 1.1 — Network Technologies

TOPIC 2 — Global Networks

Sub-topic 2.1 — Networks and Standards
Sub-topic 2.2 — Description
Sub-topic 2.3 — Global Architecture
Sub-topic 2.4 — Air-Ground Sub-networks
Sub-topic 2.5 — Ground-Ground Sub-networks
Sub-topic 2.6 — Air-Ground Applications

Subject 6: COMMUNICATION — RECORDERS

TOPIC 1 — Legal Recorders

Sub-topic 1.1 — Regulations
Sub-topic 1.2 — Principles

Subject 7: NAVIGATION — PBN NDB

TOPIC 1 — NAV Concepts

Sub-topic 1.1 — NOTAM

Subject 8: NAVIGATION — GROUND-BASED SYSTEMS - NDB

TOPIC 1 — NDB Locator

Sub-topic 1.1 — Use of the System

Subject 9: NAVIGATION — GROUND-BASED SYSTEMS - DFI

TOPIC 1 — SMCNAV — DF

Sub-topic 1.1 — Use of the System

Subject 10: NAVIGATION — GROUND-BASED SYSTEMS - VOR

TOPIC 1 — VOR

Sub-topic 1.1 — Use of the System

Subject 11: NAVIGATION — GROUND-BASED SYSTEMS - DME

TOPIC 1 — DME

Sub-topic 1.1 — Use of the System

Subject 12: NAVIGATION — GROUND-BASED SYSTEMS - ILS

TOPIC 1 — ILS

Sub-topic 1.1 — Use of the System

15. SYSTEM MONITORING AND CONTROL — SURVEILLANCE

Subject 1: ANS STRUCTURE

TOPIC 1 — ANSP Organisation and Operation

Sub-topic 1.1 — ANSP Organisation and Operation

TOPIC 2 — ANSP Maintenance Program

Sub-topic 2.1 — Policy

TOPIC 3 — ATM Context

Sub-topic 3.1 — ATM Context

TOPIC 4 — ANSP Administrative Practices

Sub-topic 4.1 — Administration

Subject 2: ANS SYSTEM/EQUIPMENT

TOPIC 1 — Operational Impacts

Sub-topic 1.1 — SMCSUR — Degradation or Loss of System/Equipment Services

TOPIC 2 — User Position Functionality and Operation

Sub-topic 2.1 — User Working Position

Sub-topic 2.2 — SMC Working Position

Subject 3: TOOLS, PROCESSES AND PROCEDURES

TOPIC 1 — Requirements

Sub-topic 1.1 — SMS

Sub-topic 1.2 — QMS

Sub-topic 1.3 — SMS application in the working environment

TOPIC 2 — Maintenance Agreements with Outside Agencies

Sub-topic 2.1 — Principles of agreements

TOPIC 3 — SMC General Processes

Sub-topic 3.1 — Roles and responsibilities

TOPIC 4 — Maintenance Management Systems

Sub-topic 4.1 — Reporting

Subject 4: TECHNOLOGY

TOPIC 1 — Technologies and Principles

Sub-topic 1.1 — General

Sub-topic 1.2 — Communication

Sub-topic 1.3 — Facilities

Subject 5: COMMUNICATION — DATA

TOPIC 1 — European Networks

Sub-topic 1.1 — Network Technologies

TOPIC 2 — Global Networks

Sub-topic 2.1 — Networks and Standards
Sub-topic 2.2 — Description

Sub-topic 2.3 — Global Architecture Sub-topic 2.4 — Air-Ground Sub-networks Sub-topic 2.5 — Ground-Ground sub-networks
Sub-topic 2.6 — Air-Ground Applications

Subject 6: COMMUNICATION — RECORDERS

TOPIC 1 — Legal Recorders

Sub-topic 1.1 — Regulations
Sub-topic 1.2 — Principles

Subject 7: NAVIGATION — PBN

TOPIC 1 — NAV Concepts

Sub-topic 1.1 — NOTAM

Subject 8: SURVEILLANCE — PRIMARY

TOPIC 1 — ATC Surveillance

Sub-topic 1.1 — Use of PSR for Air Traffic Services

Subject 9: SURVEILLANCE — SECONDARY

TOPIC 1 — SSR AND MSSR

Sub-topic 1.1 — Use of SSR for Air Traffic Services

TOPIC 2 — Mode S

Sub-topic 2.1 — Introduction to Mode S

TOPIC 3 — Multilateration

Sub-topic 3.1 — MLAT Principles

Subject 10: SURVEILLANCE — HMI

TOPIC 1 — HMI

Sub-topic 1.1 — ATCO HMI

Subject 11: SURVEILLANCE — DATA TRANSMISSION

TOPIC 1 — Surveillance Data Transmission

Sub-topic 1.1 — Technology and Protocols

16. SYSTEM MONITORING AND CONTROL — DATA

Subject 1: ANS STRUCTURE

TOPIC 1 — ANSP Organisation and Operation

Sub-topic 1.1 — ANSP Organisation and Operation

TOPIC 2 — ANSP Maintenance Program

Sub-topic 2.1 — Policy

TOPIC 3 — ATM Context

Sub-topic 3.1 — ATM Context

TOPIC 4 — ANSP ADMINISTRATIVE PRACTICES

Sub-topic 4.1 — Administration

Subject 2: ANS SYSTEM/EQUIPMENT

TOPIC 1 — Operational Impacts

Sub-topic 1.1 — Degradation or Loss of System/Equipment Services

TOPIC 2 — User Position Functionality and Operation

Sub-topic 2.1 — User Working Position

Sub-topic 2.2 — SMC Working Position

Subject 3: TOOLS, PROCESSES AND PROCEDURES

TOPIC 1 — SMCDAT — Requirements

Sub-topic 1.1 — SMS

Sub-topic 1.2 — QMS

Sub-topic 1.3 — SMS application in the working environment

TOPIC 2 — Maintenance Agreements with Outside Agencies

Sub-topic 2.1 — Principles of agreements

TOPIC 3 — SMC General Processes

Sub-topic 3.1 — Roles and responsibilities

TOPIC 4 — Maintenance Management Systems

Sub-topic 4.1 — Reporting

Subject 4: TECHNOLOGY

TOPIC 1 — Technologies and Principles

Sub-topic 1.1 — General

Sub-topic 1.2 — Communication

Sub-topic 1.3 — Facilities

Subject 5: COMMUNICATION — DATA

TOPIC 1 — European Networks

Sub-topic 1.1 — Network Technologies

TOPIC 2 — Global Networks

Sub-topic 2.1 — Networks and Standards
Sub-topic 2.2 — Description
Sub-topic 2.3 — Global Architecture
Sub-topic 2.4 — Air-Ground Sub-networks
Sub-topic 2.5 — Ground-Ground sub-networks
Sub-topic 2.6 — Air-Ground Applications

Subject 6: COMMUNICATION — RECORDERS

TOPIC 1 — Legal Recorders

Sub-topic 1.1 — Regulations
Sub-topic 1.2 — Principles

Subject 7: NAVIGATION — PBN

TOPIC 1 — SMCDAT — NAV Concepts

Sub-topic 1.1 — NOTAM

Subject 8: SURVEILLANCE — PRIMARY

TOPIC 1 — ATC Surveillance

Sub-topic 1.1 — Use of PSR for Air Traffic Services

Subject 9: SURVEILLANCE — SECONDARY

TOPIC 1 — SSR AND MSSR

Sub-topic 1.1 — Use of SSR for Air Traffic Services

TOPIC 2 — Mode S

Sub-topic 2.1 — Introduction to Mode S

TOPIC 3 — Multilateration

Sub-topic 3.1 — MLAT Principles

Subject 10: SURVEILLANCE — HMI

TOPIC 1 — HMI

Sub-topic 1.1 — ATCO HMI

Subject 11: SURVEILLANCE — DATA TRANSMISSION

TOPIC 1 — Surveillance Data Transmission

Sub-topic 1.1 — Technology and Protocols

Subject 12: SURVEILLANCE — DATA PROCESSING SYSTEMS

TOPIC 1 — User Requirements

Sub-topic 1.1 — Controller requirements

Sub-topic 1.2 — Trajectories, Prediction and Calculation
Sub-topic 1.3 — Ground Safety Nets

Sub-topic 1.4 — Decision Support

Subject 13: SURVEILLANCE — DATA PROCESS

TOPIC 1 — Hardware Platform

Sub-topic 1.1 — Equipment Upgrade

Sub-topic 1.2 — COTS

Sub-topic 1.3 — Interdependence

Subject 14: SURVEILLANCE — DATA

TOPIC 1 — Data Essentials Features

Sub-topic 1.1 — Data Significance Sub-
topic 1.2 — Data Configuration Control
Sub-topic 1.2 — Data Standards