

# Aviation in Iceland

FAA/NASA Joint University  
Program Quarterly Meeting at MIT  
17 October, 2002



# Overview

- » **Air Transport Industry**
- » **Civil Aviation Authority**
- » **Air Traffic Services**
- » **Development of ATM Systems**
- » **R&D Activity in ATM**



# Air Transport Operators

## » Icelandair

- 12 Boeing 757
- 1 Boeing 737

## » Air Iceland

- 4 Fokker F50
- 3 Metro 26

## » Air Atlanta

- 17 B-747/200/300
- 8 B-767/200
- 2 B-757
- 1 L-1011

## » Islandsflug

- 6 B-737/300
- 1 Airbus 300
- 2 Dornier 228

## » Bluebird

- 2 B-737/300

## » MD Airlines

- 4 MD 83



# Icelandair B757-200



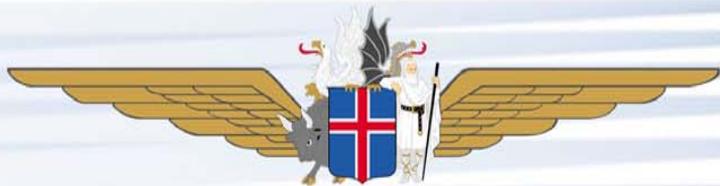
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ICAA October 2002



# Icelandair B757-300





# Air Atlanta B 747-200



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# Air Atlanta B747-200



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# Air Atlanta B 767





# Bluebird B737-300



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# Air Iceland Fokker 50



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## Air Iceland Metro 26



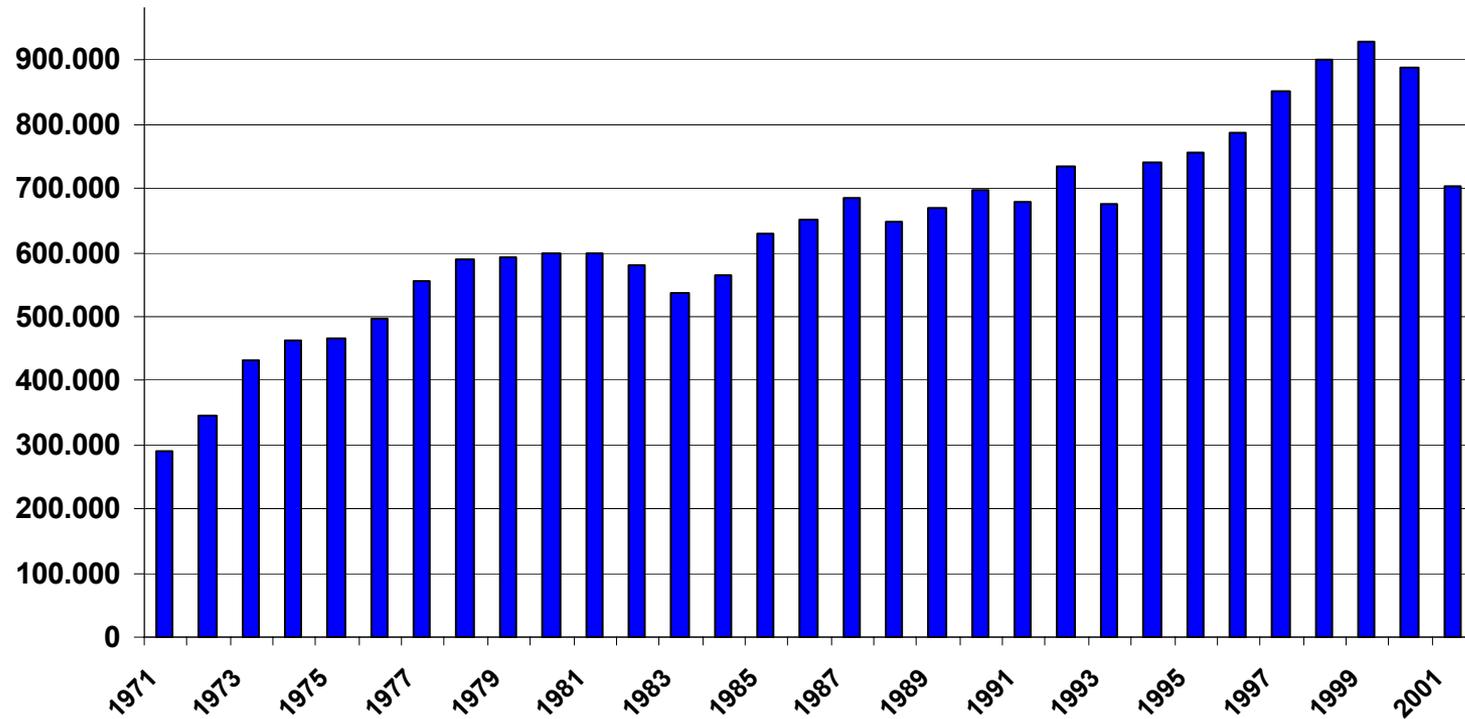


# Íslandsflug Dornier 228



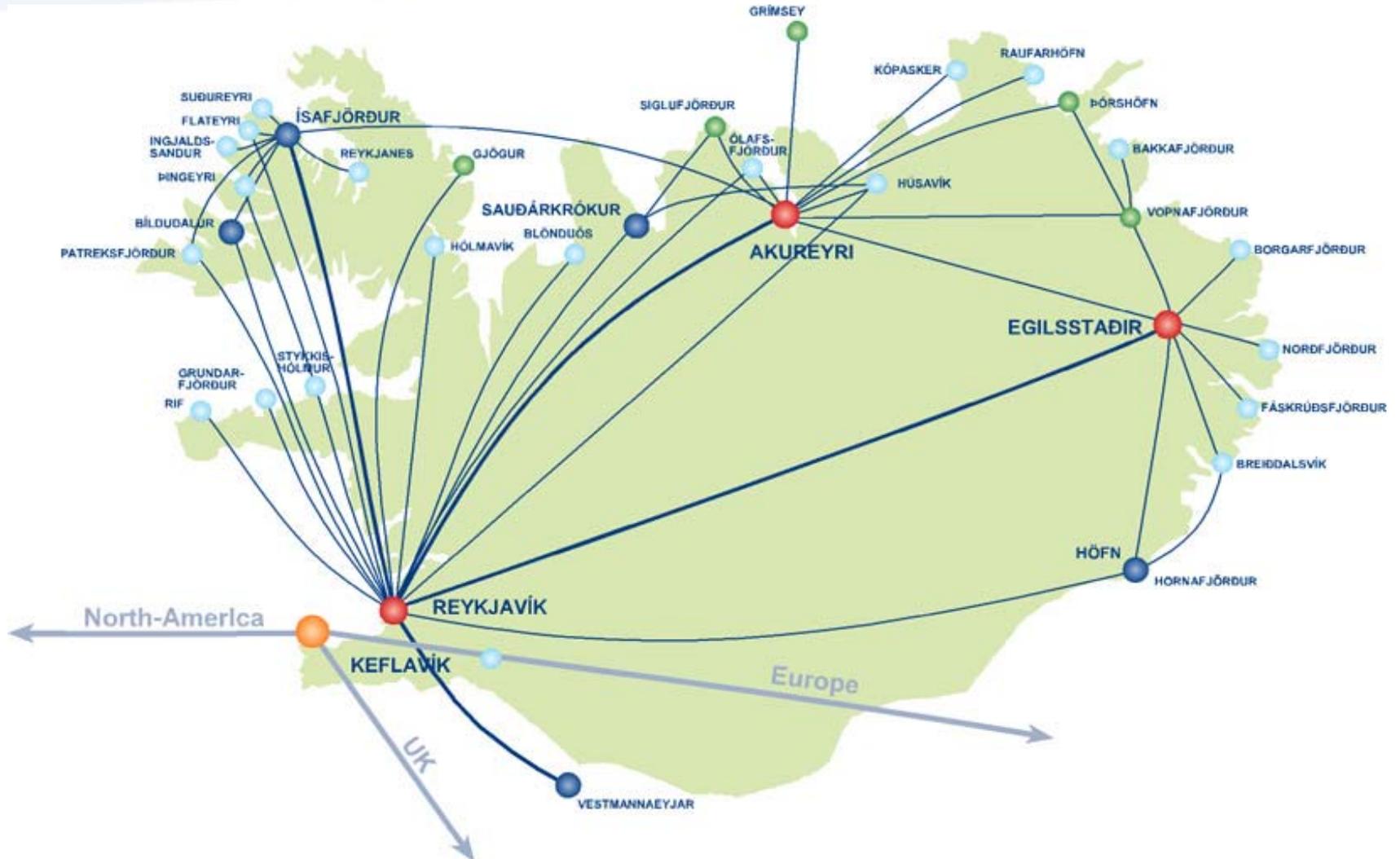


# Domestic Passengers 1971 - 2001



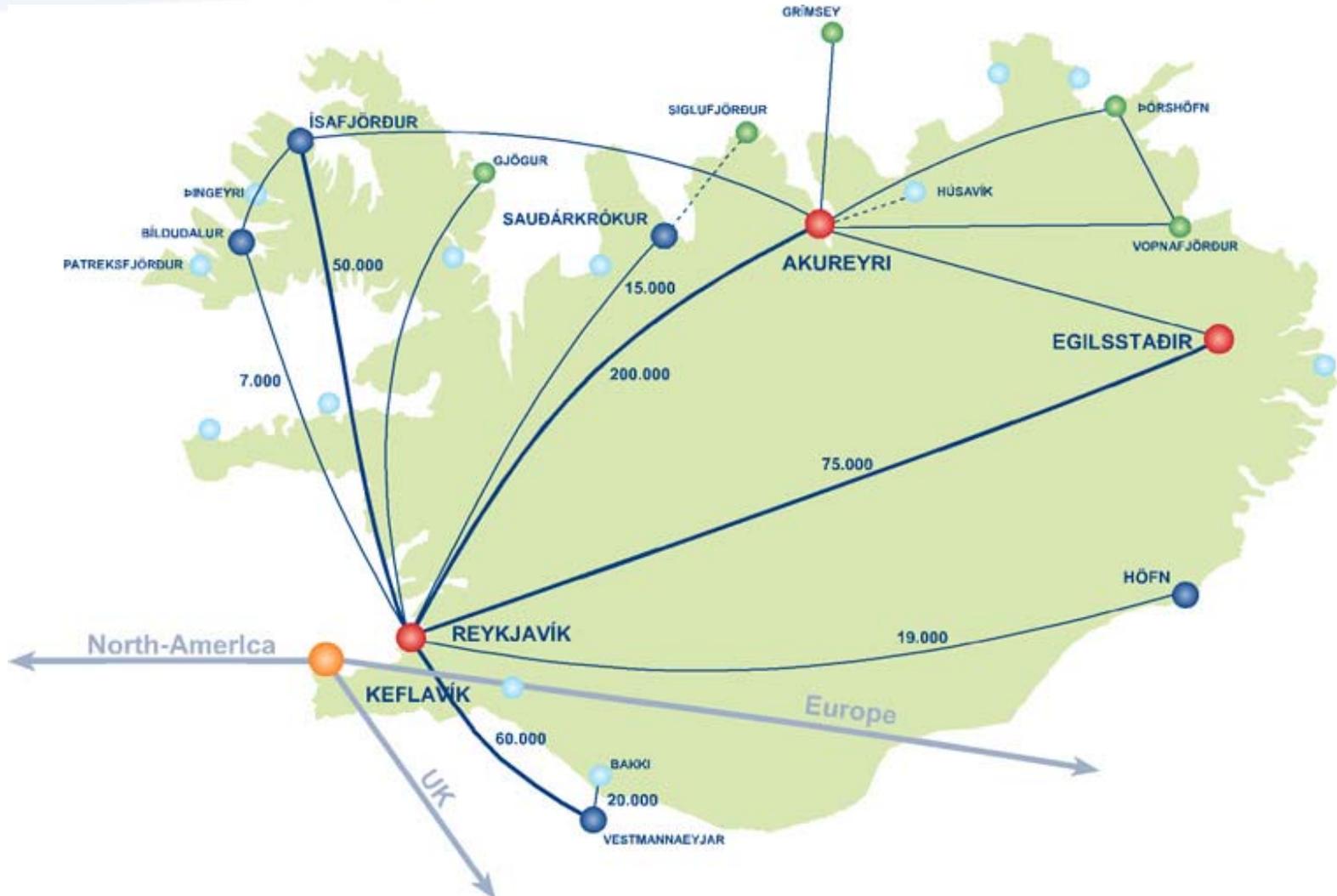


# Domestic Air Routes 1986





# Domestic Air Routes 2001

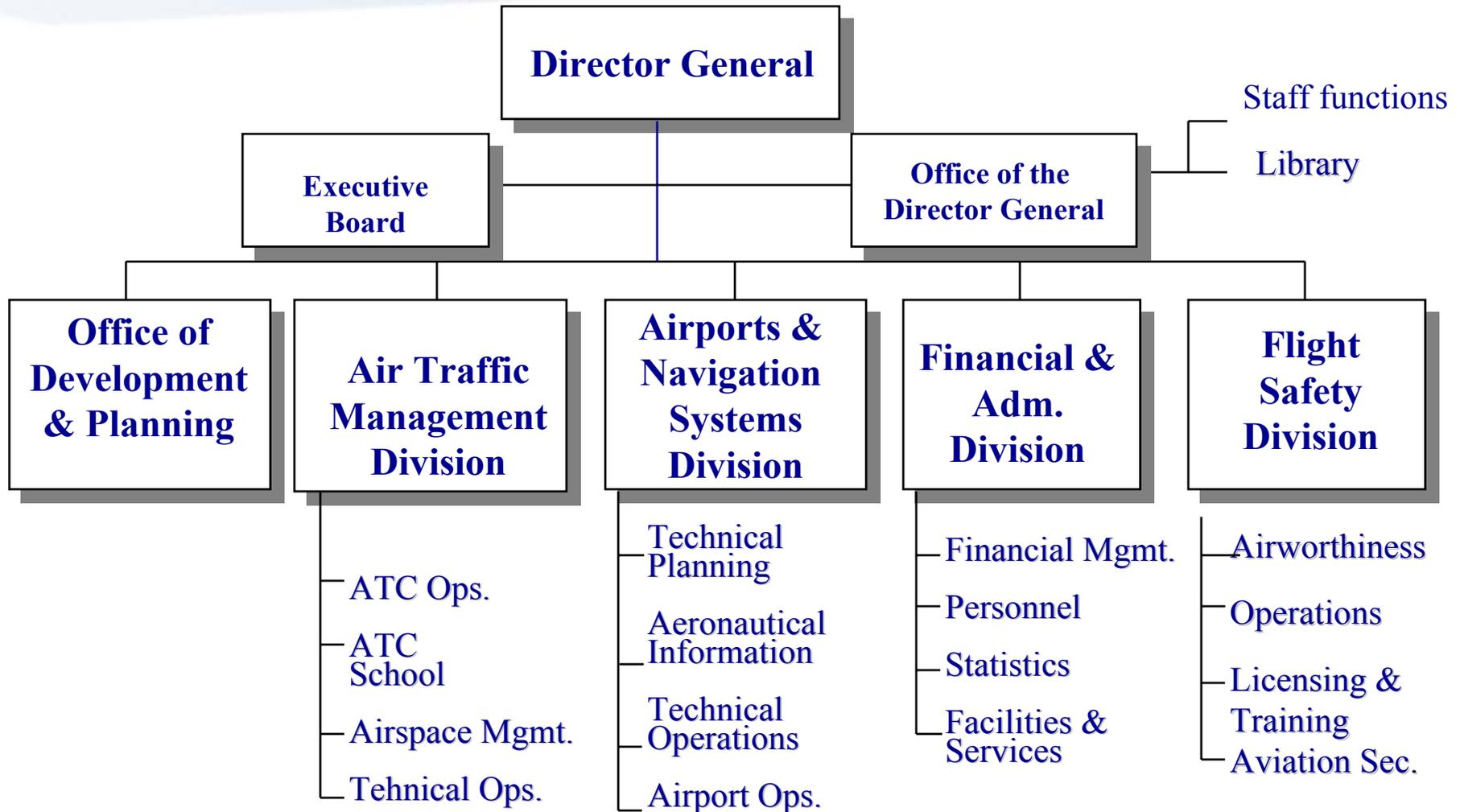




# **Icelandic Civil Aviation Administration**



# Organization Structure ICAA





# Role of ICAA

## » **Public Administration**

- Policy and Planning
- Information on Aviation Activities
- International Cooperation
- Research and Development

## » **Safety Regulation**

- Registration of Aircraft
- Airworthiness
- Air Transport Operations
- Licensing
- Aviation Security

## » **Service Provision**



# Service Provision

## » Airport Operations

- Reykjavík Airport
- 11 Airports w/scheduled services
- 17 general and ambulance service
- 51 landing strips

## » Navigation and Communications Systems

- Approach and Landing Systems
- En-Route Systems



# Service Provision...(cont.)

## » Air Traffic Services

- International Air Traffic Services
- Domestic Air Traffic Services
- Tower Services (Reykjavík, Akureyri, Vestmannaeyjar)
- Approach Services (Reykjavík, Keflavík)\*

## » Technical Development

- TERN Systems Inc.

\* ICAA Operational Responsibility

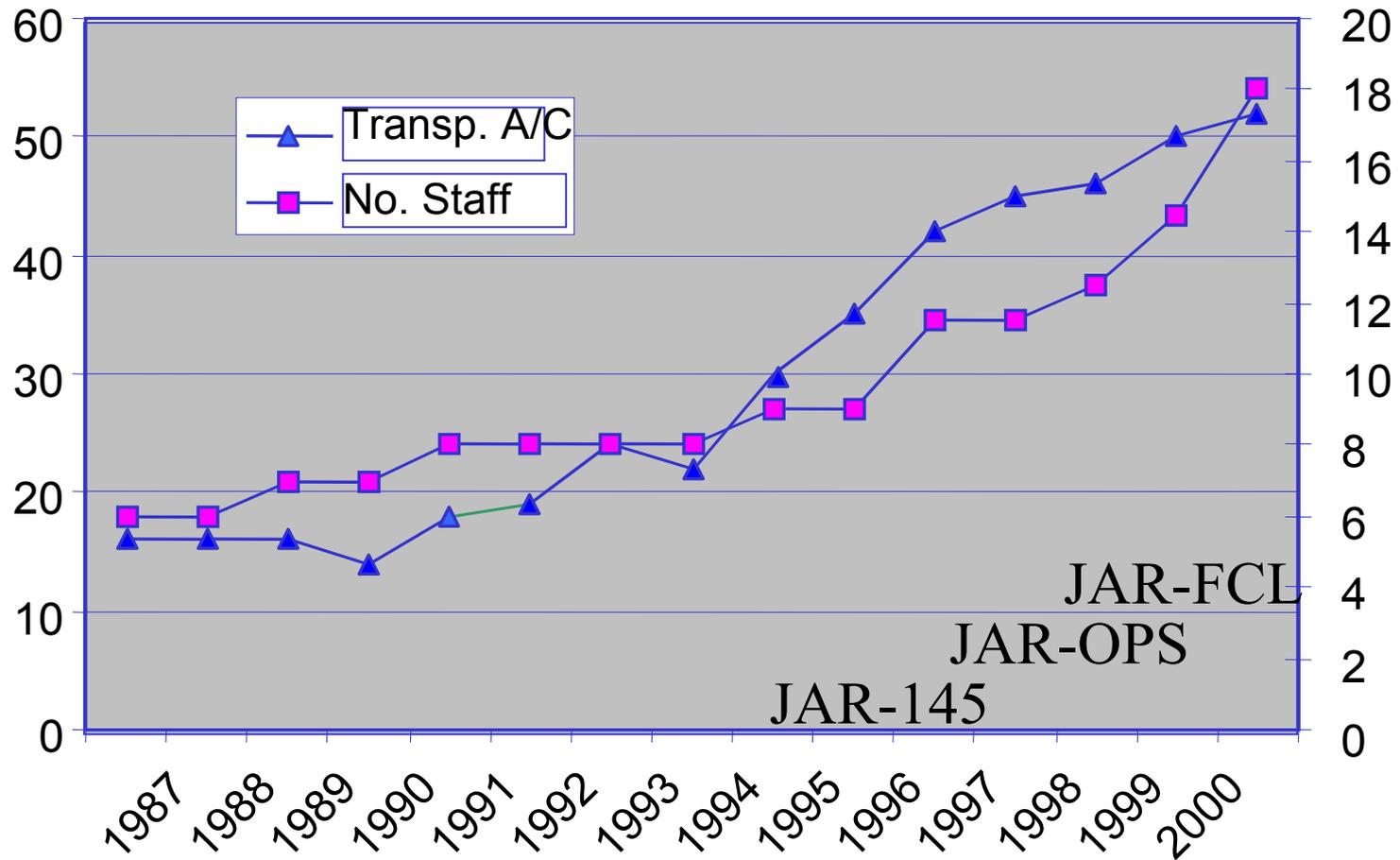


# Safety Regulation

- » **Implementation of Joint Aviation Regulations**
  - JAR 145
  - JAR OPS
  - JAR FCL
- » **Implementaton of Quality Management Systems**
- » **Safety Management Systems in Airports and Air Traffic Management**
- » **Auditing by International Organizations**
  - ICAO USOAP Audit in 2000
  - JAA Audits



## Number of Staff and Transport Aircraft





# Reconstruction of Reykjavik Airport





# Reykjavik Airport

16. október 2002





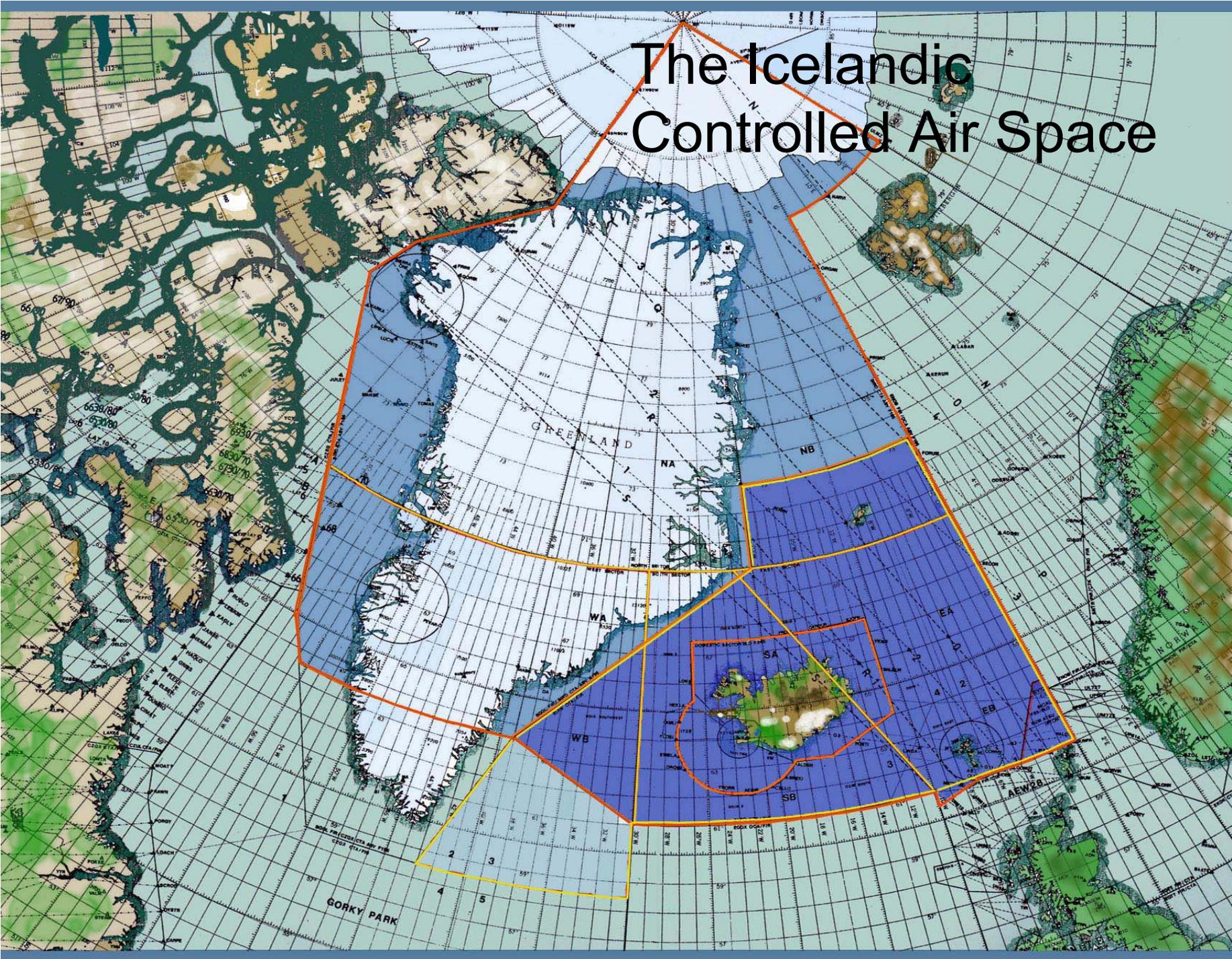
# Major Challenges

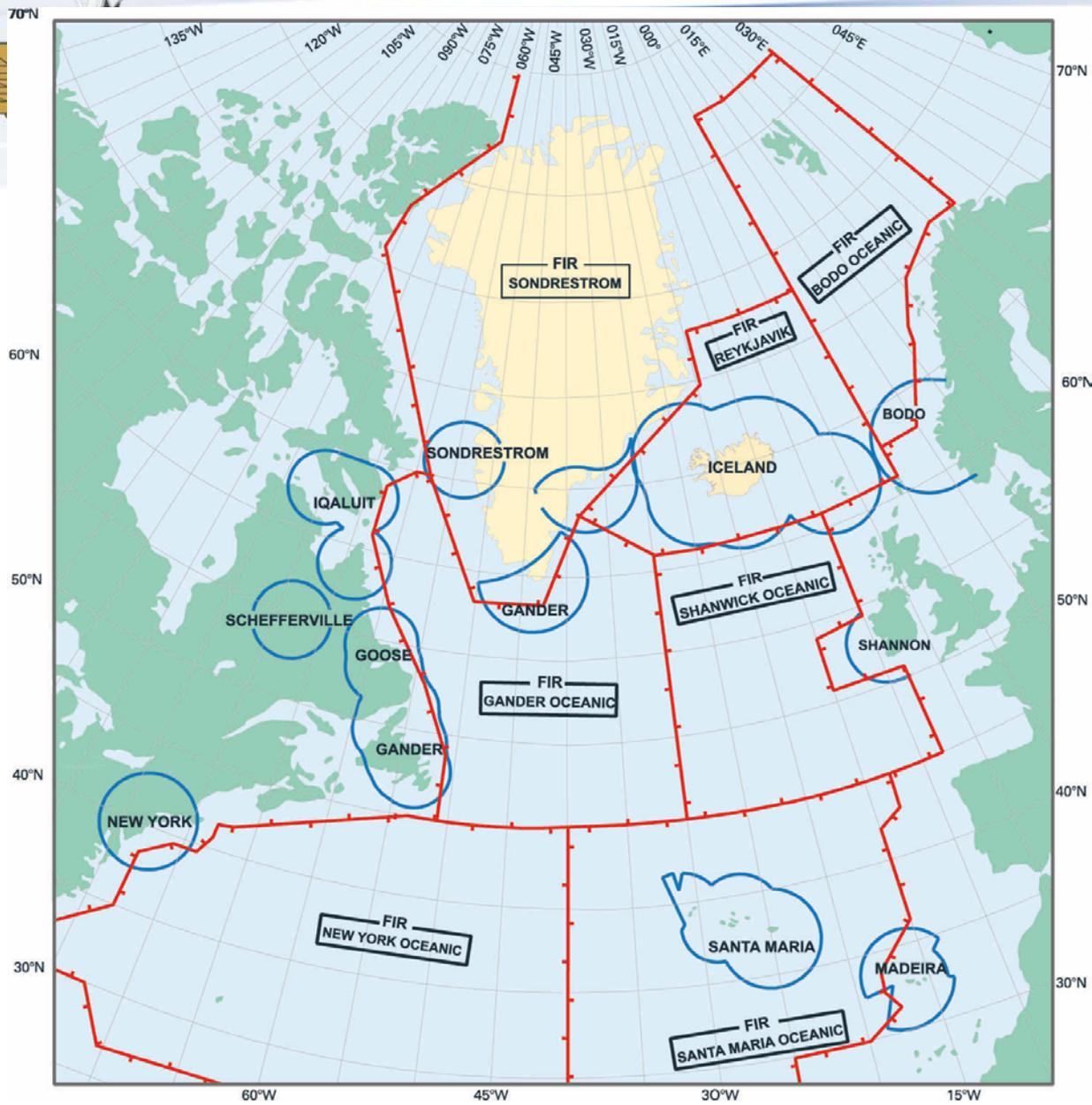
- » **Continued implementation of European Safety Regulations**
  - JAA
  - EASA
  - Eurocontrol
- » **Development of the Air Traffic Management System**
  - International Air Traffic Services
- » **Continued Improvement of Domestic Airport Network**
  - National Transport Plan
- » **Application of Information Technology to Improve Services to the Air Transport Industry**

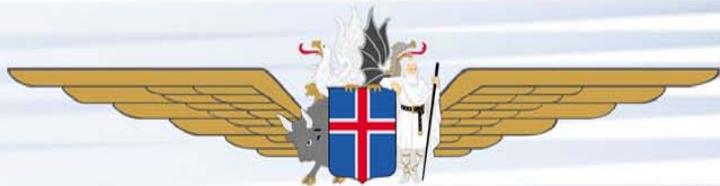


# **ATM Services Provided by Iceland**

# The Icelandic Controlled Air Space





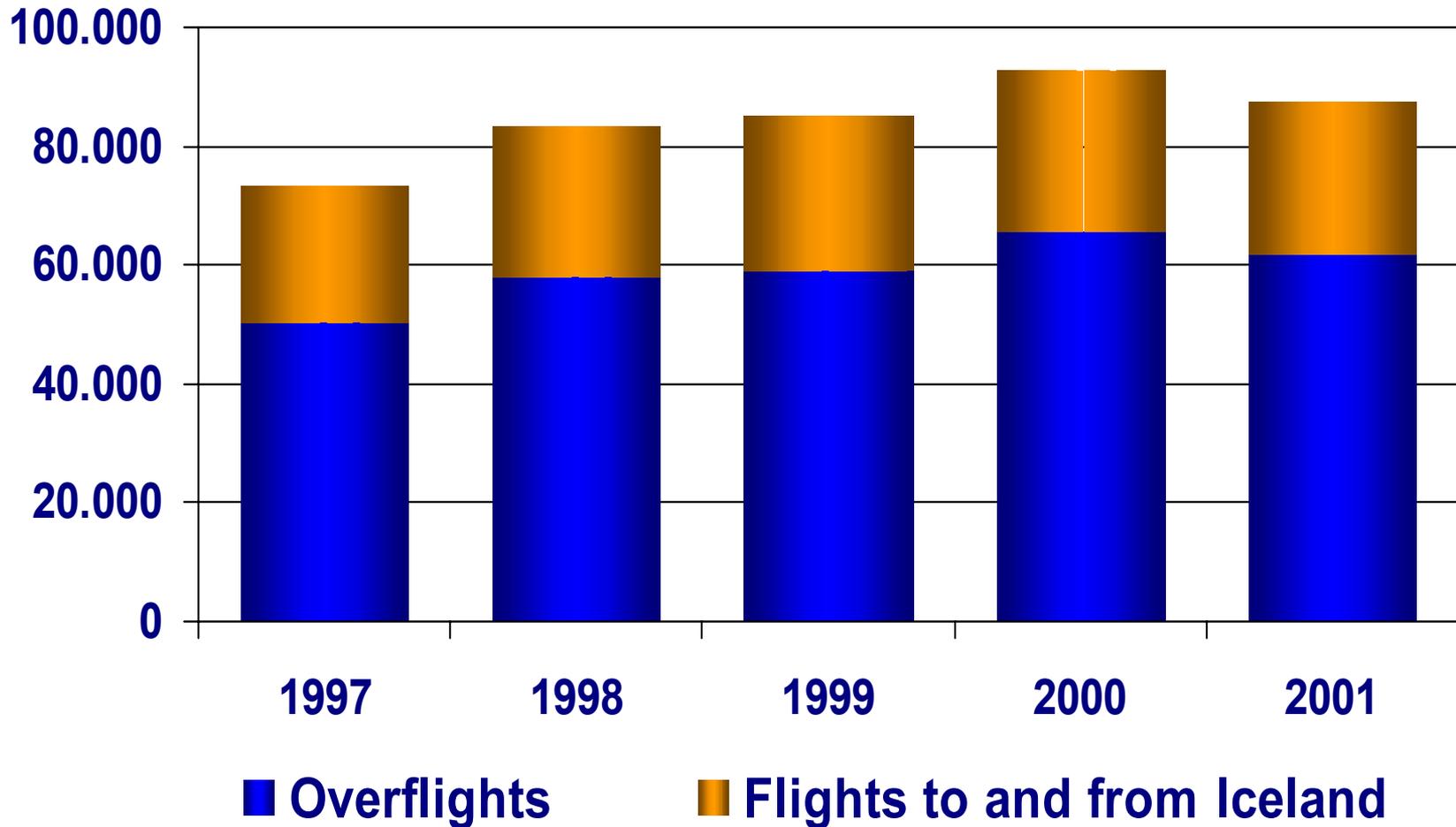


# Reykjavík Area Control Center



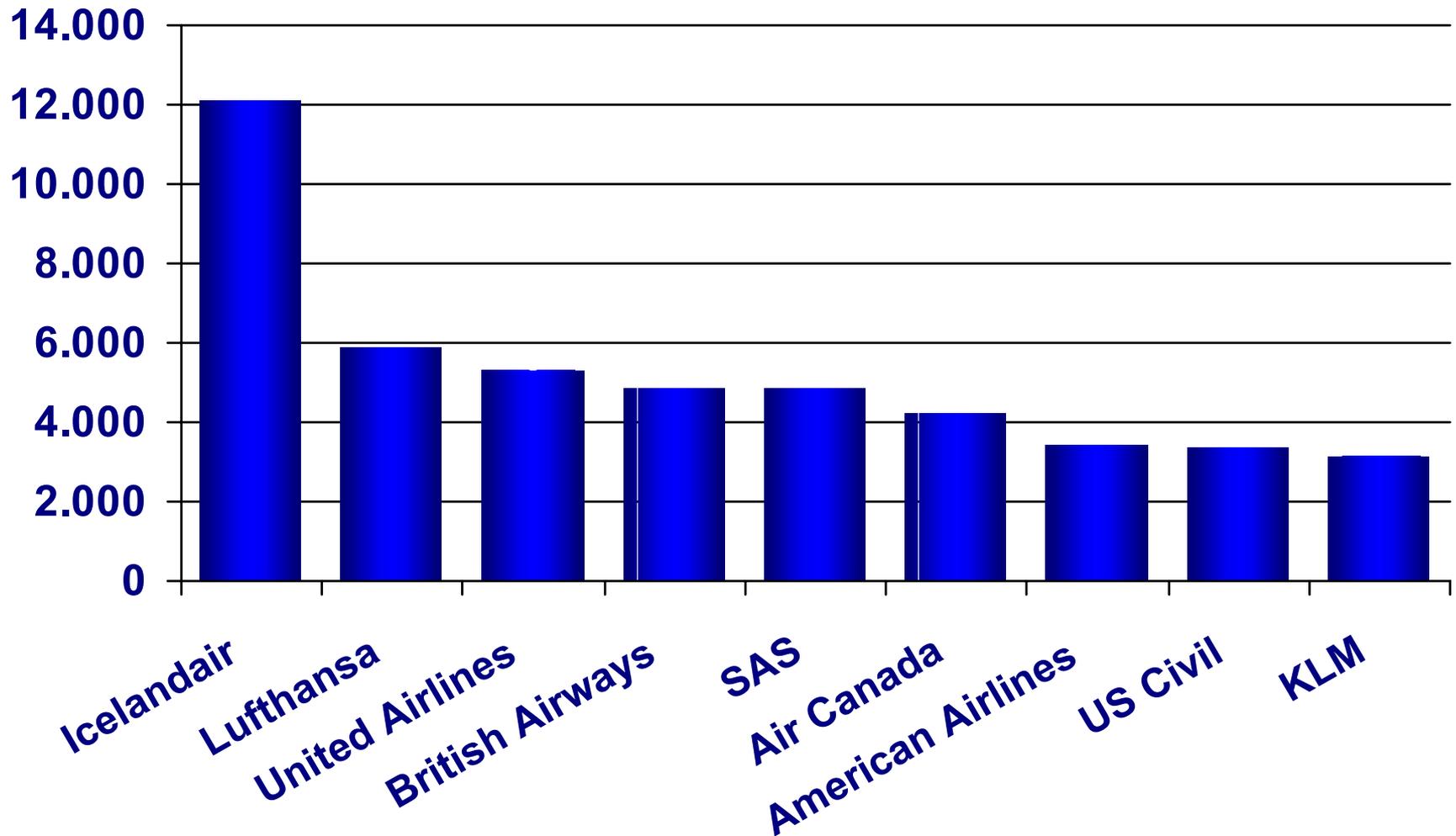


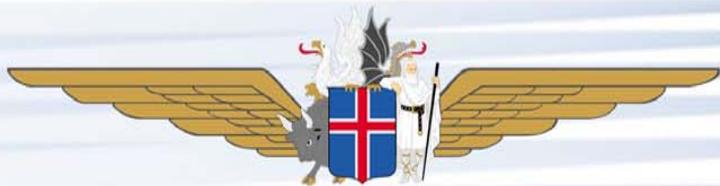
# Statistic ATC traffic





# Statistic Operators





# Reykjavík Area Control Center





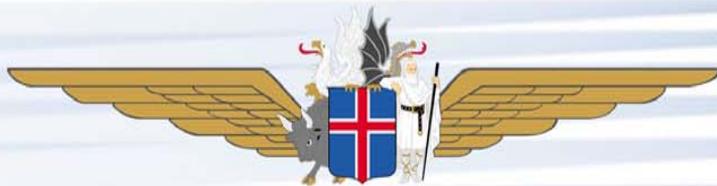
# Air Traffic Control Services





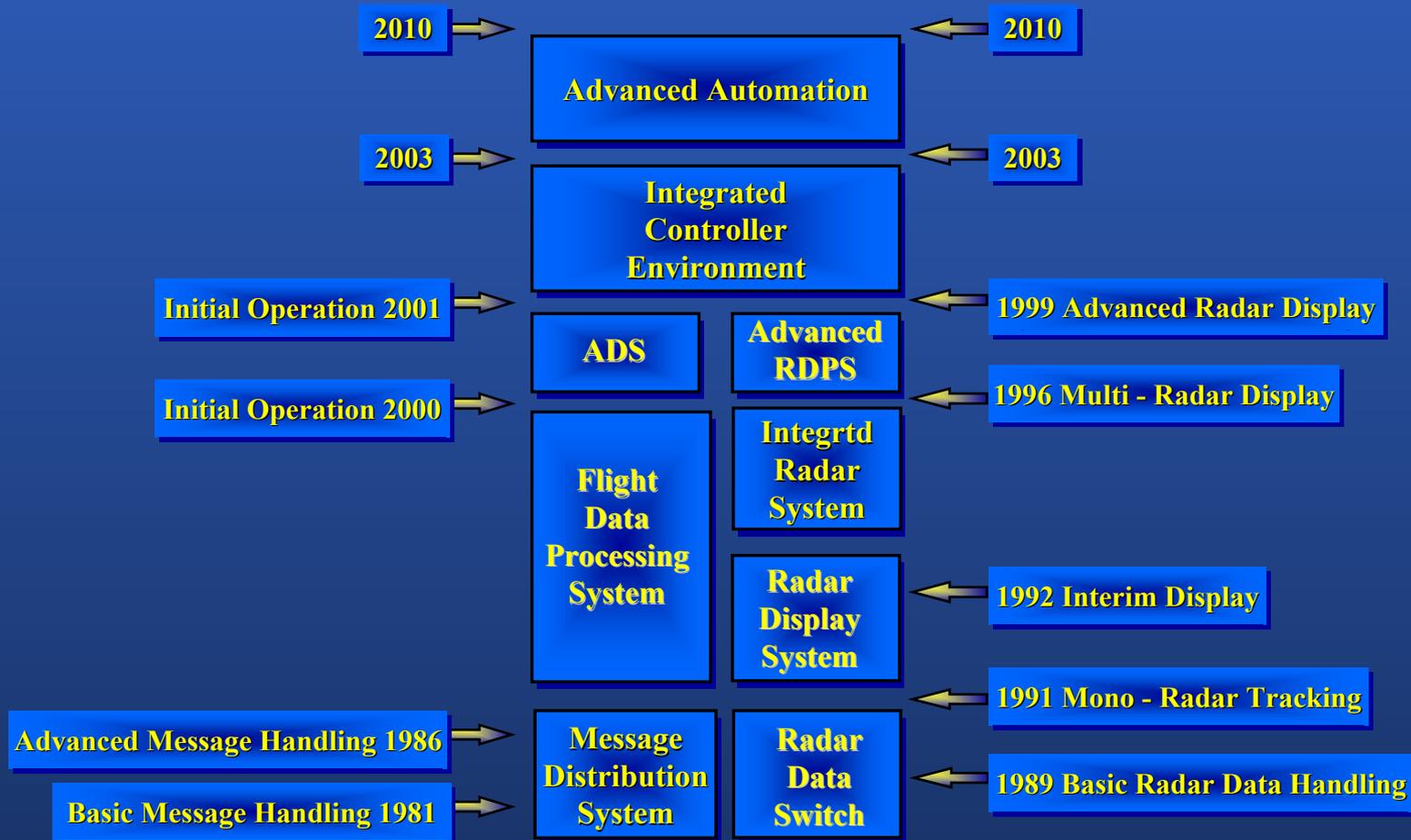
# Flight Data Processing System





# Development of ATM Systems

# System Building Blocks





# ATM Development Projects

- » **Radar Data Processing System**
  - Single Radar Tracking
  - Multi Radar Tracking
  - Short/Medium Term Conflict Alert
- » **Flight Data Processing System**
  - Message Distribution System
  - Adaptation of Third-Party FDPS
  - Situation Display
- » **Controller Work Station**
  - RDPS Situation Display (10 versions)
  - Integrated Controller Environment HMI



# ATM Development Projects...(Cont.)

## » ATC Simulator Developments

- RDPS Test and Validation
- ATC Training
- Cost – Benefit Analyses (NICE)

## » Communications Control System

- Maintainability
- New Functionality



# Evolutionary System Development

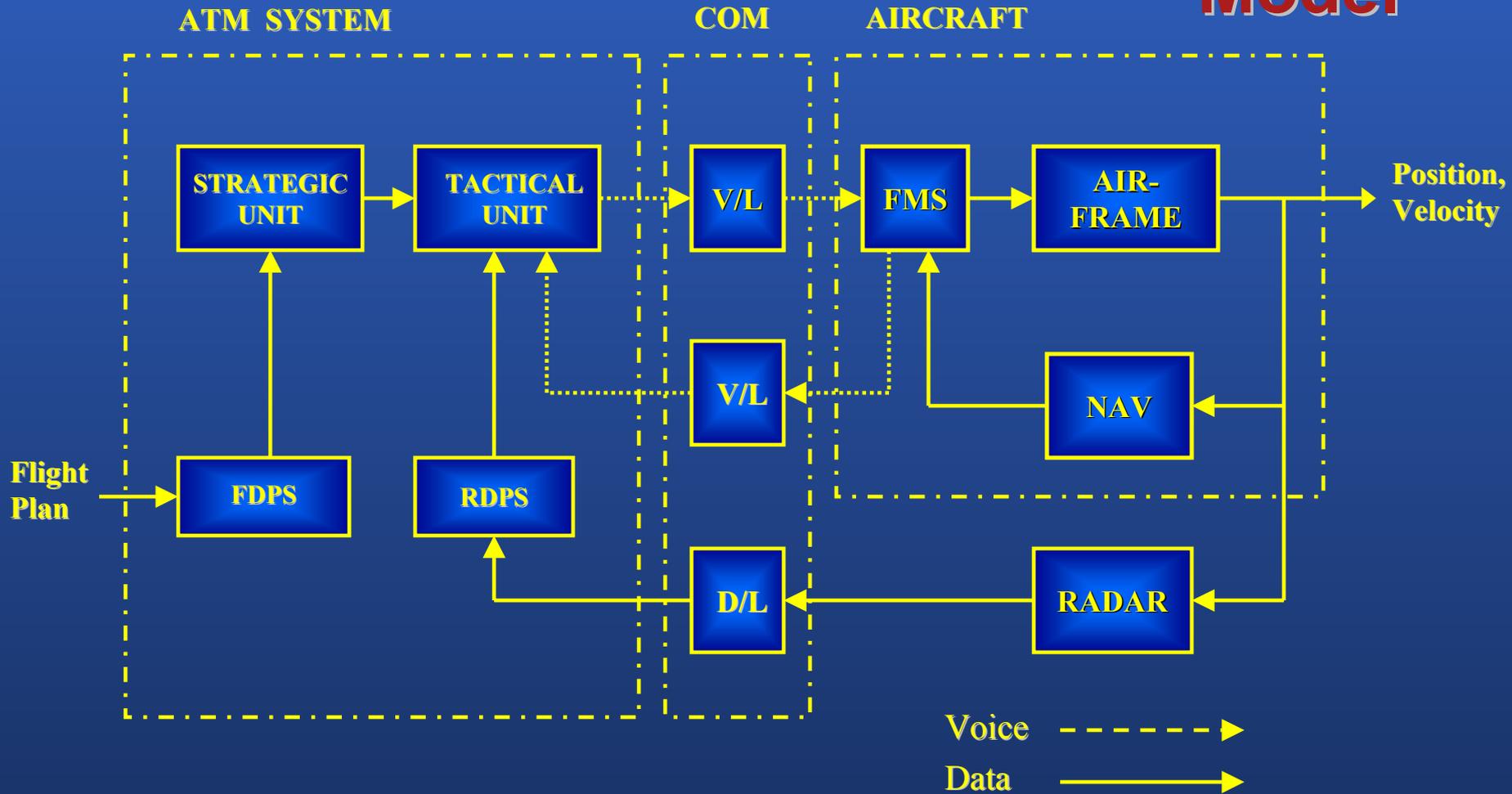
## Advantages

- » Early Benefits
- » Smaller Development Projects
- » Lower Technical Risk
- » Distributed Training Effort
- » Simpler System Integration

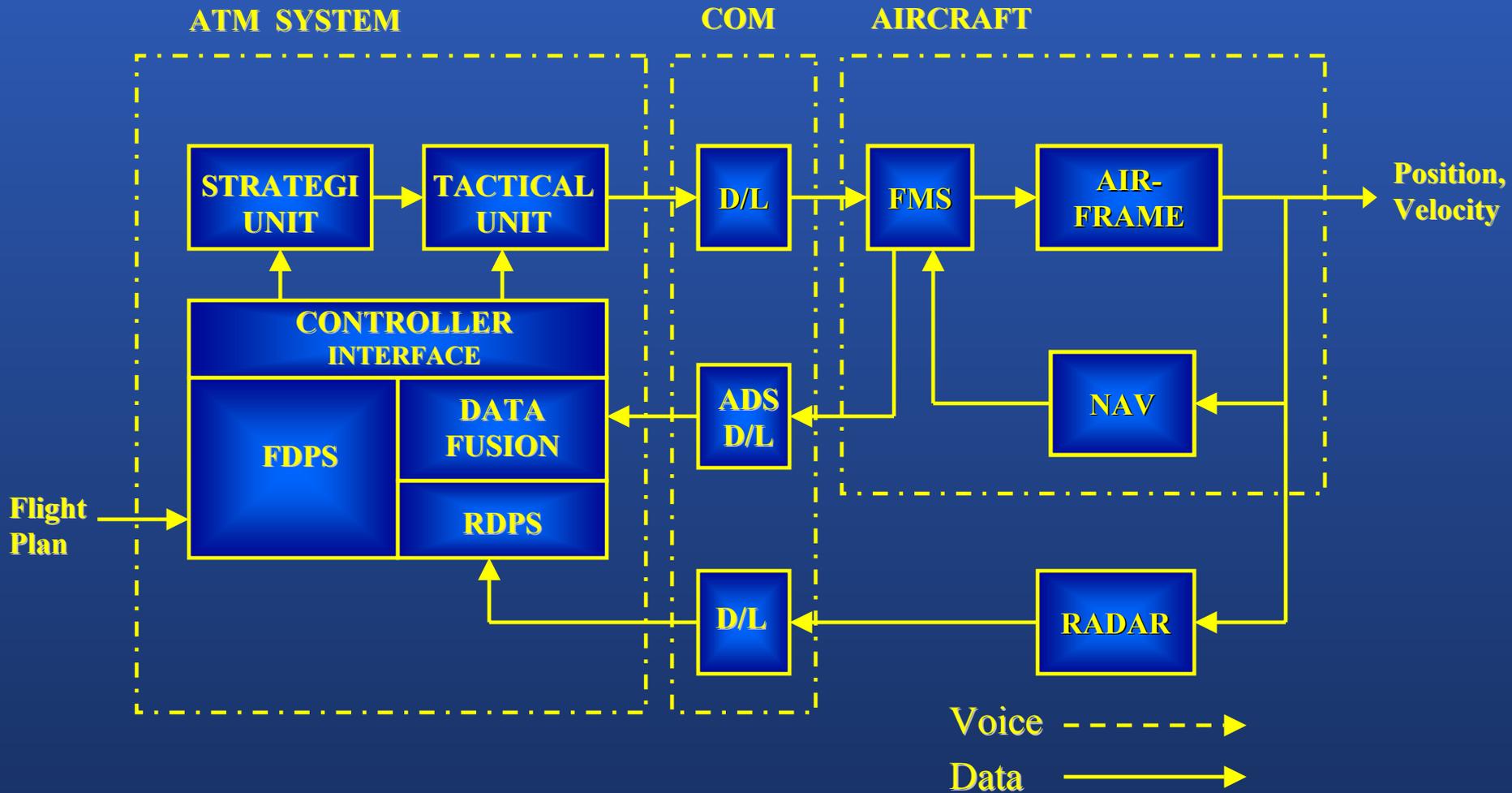
## Disadvantages

- » Lower level of Integration
- » Lesser System Homogeneity

# CNS/ATM Conceptual Model



# CNS/ATM Conceptual Model



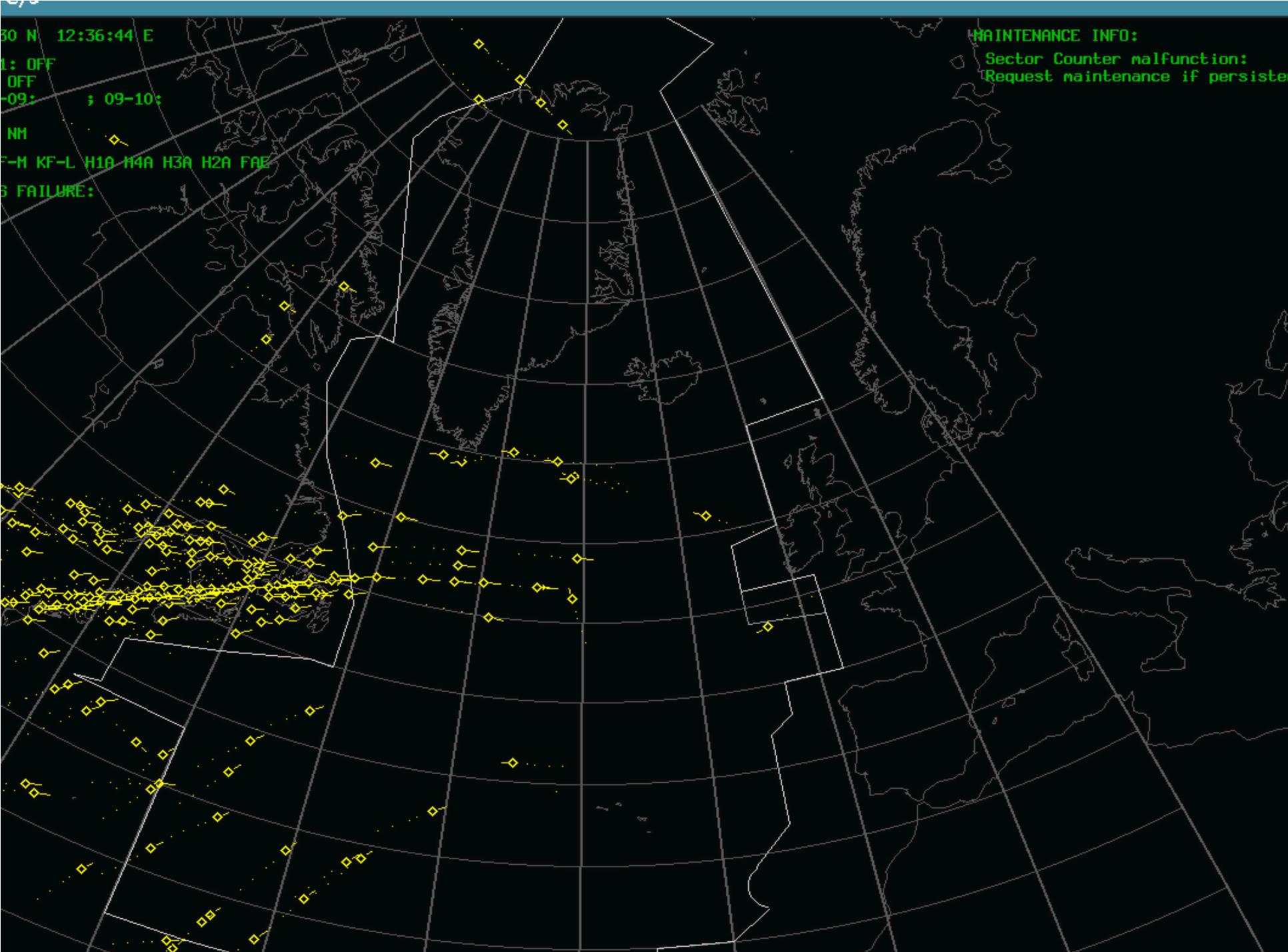
30 N 12:36:44 E

1: OFF  
OFF  
-09: ; 09-10:

NM  
F-M KF-L H1A H4A H3A H2A FAE

S FAILURE:

MAINTENANCE INFO:  
Sector Counter malfunction:  
Request maintenance if persists





# ATM R&D Focal Areas

- » **Integration of FDPS/RDPS**
  - Oceanic Controller WorkStation
  - Human Factors Aspects
- » **FANS 1/A Technology**
  - Waypoint Reporting
  - CPDLC
  - ADS – C
  - Oceanic Clearance Delivery
- » **ADS – B**
- » **Data Fusion**
- » **Decision Support Tools**



## Other R&D Areas

- » **Risk Assessments**
  - Third Party Risk
  - Safety Assessments
  - Quantitative Methods
- » **Safety Management Systems**
  - Safety Cases
  - Safety Assessments
- » **GNSS Implementation**
  - WAAS Operational Trials



# FAA B727 during WAAS Trials at Keflavik Airport





# ICAA Beech King Air During WAAS Trials





# FAA/MIT/ICAA/UI Cooperative Program

- » **Development of the Future Oceanic Air Traffic Control System**
  - Controller Work Station
  - Human Factors Approach
  - Automatic Dependent Surveillance
  
- » **Consideration of the Special Requirements of Oceanic Air Traffic Management**