# MID AIDC/OLDI Seminar

# Basic SYSCO Principles and Standard OLDI Communication

## ICAO EUR/NAT Office

### Celso Figueiredo – Regional Officer ANS - ATM

*Cairo, Egypt*

*3 to 5 March 2014*

# By the end of the Presentation you will have a:

- basic understanding of the need for exchange of data in Air Traffic Control (ATC);
- an overview of SYSCO standard co-ordination and basic transfer messages as they are used in most ATM systems;
- understanding of SYSCO terminology;
- definition of Standard OLDI message types;
- purpose of Standard OLDI messages;
- timing of the transmission of Standard OLDI messages;
- system responses to Standard OLDI messages.

# What's OLDI? *1*

- Flights which are being provided with an ATC service are transferred from one ATC unit to the next in a manner designed to ensure complete safety.
- In order to accomplish this, it is a standard procedure that the passage of each flight across the boundary of the areas of responsibility of the two units is co-ordinated between them before the flight reaches the boundary.
- In OLDI, and in the ATM systems, we call this process the ***Coordination Phase***.

# What's OLDI?  *2*

- After the receipt of coordination information, the receiving controller uses this information to provide view of the traffic in relation to other aircraft and airspace features.

- When the flight arrives at, or adjacent to, the boundary between the ATC units, control of the flight is transferred to the next unit.

- In OLDI, and in the ATM systems, we call this the *Transfer Phase*.

# What's OLDI?    *3*

- When carried out by telephone, the passing of data on individual flights is a major support task at ATC units.
- The operational use of connections between Flight Data Processing Systems (FDPS) at ACCs replaces such verbal "estimates".
- This can be achieved using ICAO messages sent by AFTN. This process is supported by most ATM systems.
- AFTN messages allow for a limited flow of standard data between ATC units. The requirement for an increase in the data transfer requirements led to the development of On-Line Data Interchange (OLDI) within Europe in the early nineteen eighties.

# What's OLDI? *4*

- In order to facilitate implementation, common rules and message formats were elaborated and agreed by the agencies concerned and incorporated in the EUROCONTROL Standard for On-Line Data Interchange.
- This process is also referred to as <u>SYSCO</u> (*System Assisted Coordination*).
- The OLDI standard is produced to support the continuing development of such facilities in compliance with the requirements of EATCHIP[1].

  [1] *EUROCONTROL ATC Harmonization and Integration Programme*

# **SYSCO**, brief description

- System Assisted Co-ordination (SYSCO) is a EUROCONTROL protocol for co-ordination and transfer between controllers.

- In the ATM systems the protocol is used between ATC centers and between ATC sectors.

- OLDI stands for: *On Line Data Interchange*.

# OLDI Messages

- OLDI messages are exchanged between ATC units to provide for the exchange of co-ordination and transfer of control information.

- We will now look at the terminology used in most ATM systems during the co-ordination and transfer process.

# SYSCO/OLDI Definitions

**Co-ordination Entry/Exit Point (COP in/out)**

- Is the agreed point, on or adjacent to the boundary between ATC areas of responsibility, used in a co-ordination sequence and referred to in co-ordination messages.

- In the ATM systems these points are qualified depending on whether they are viewed as an exit 'COP **in**' or entry 'COP **out**' point.

**Transfer Flight Level (TFL)**

- This is the level used in co-ordination messages as the level that the flight will be cleared to when transferring from one controller to another.

- In the ATM systems this level is qualified depending on whether it is viewed as the exit '**XFL**' level or planned entry '**PEL**' level.

# SYSCO/OLDI Definitions

**Cleared flight Level (CFL)**

- Is the level that the pilot is currently instructed to fly at. It may be different to the TFL mentioned above, but should normally be the same as the TFL when the flight is handed over to the next controller.

**Assigned Speed (ASP)**

- Is the speed (indicated airspeed – IAS, or Mach number) that the pilot is currently instructed to fly at. It is used by controllers to maintain the required separation between flights.

**Assigned Heading (AHDG) –**

- Is the heading, in degrees magnetic, that the pilot is currently instructed to fly.

# We will now look at the OLDI messages and their purpose.

# OLDI Messages Definitions

**ABI** **Advance Boundary Information Message**

- Initial notification and updates flight plan information

**ACT** **Activate Message**

- Automatic update of FPL data with estimate information

**PAC** **Preliminary Activate Message**

- Notification and pre-departure co-ordination where flight time to COP is too short for ACT message

**REV** **Revision Message**

- To transmit revisions to co-ordination data (time, level, code, COP)

**LAM** **Logical Acknowledgement Message**

- Automatically generated message by receiver to indicate receipt of transmitted message.

# OLDI Messages Definitions

**TIM        Transfer Initiation Message**

- At the end of the co-ordination phase, to signify the change from Coordination to Transfer phase. Includes control data (CFL, AHDG, ASP)

**SDM     Supplementary Data Message**

- To transmit changes to control data during the Transfer Phase (updates **TIM** data)

**COF       Change of Frequency Message**

- Sent by transferring controller to indicate flight has been instructed to change frequency

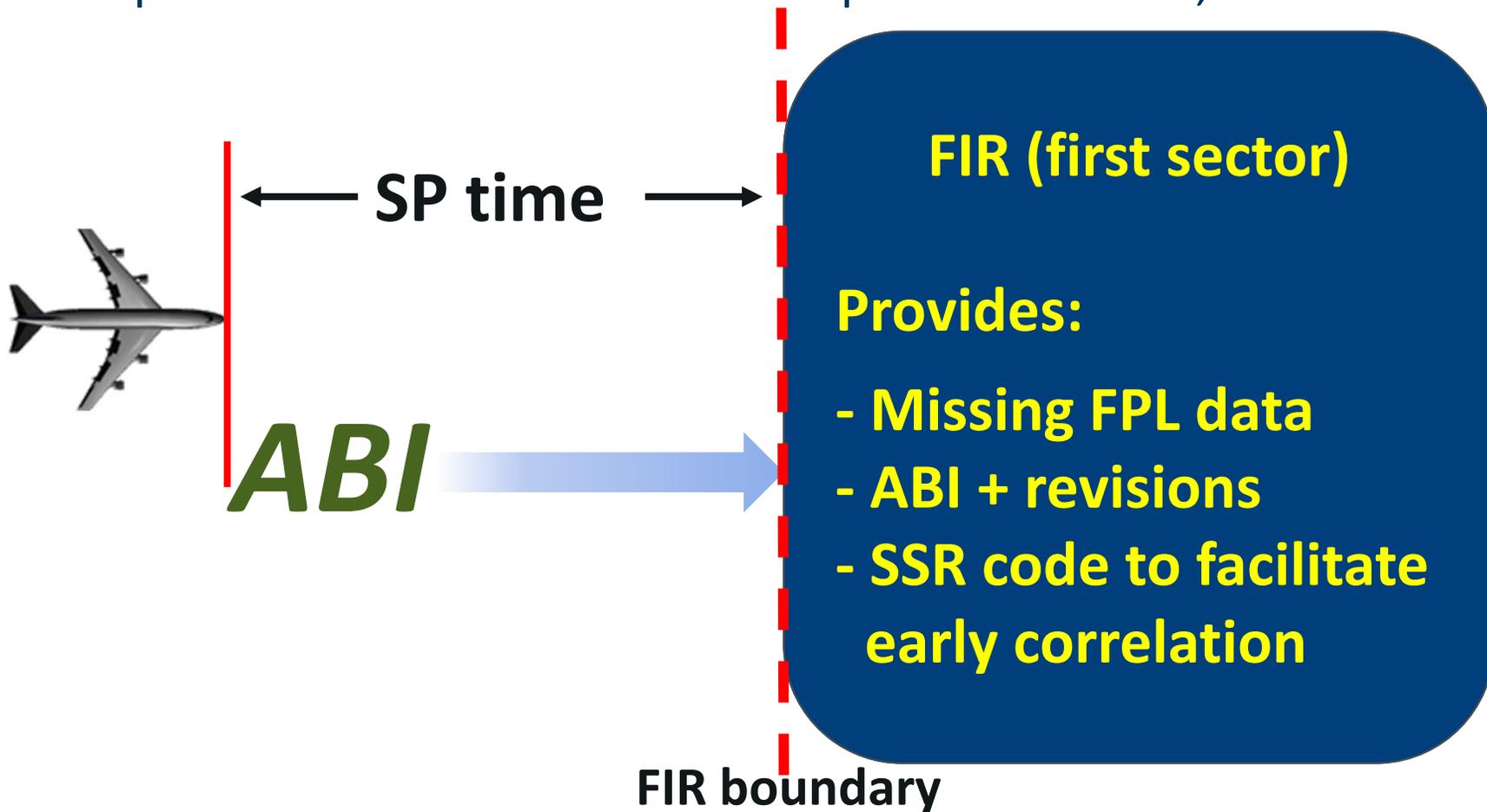**MAS     Manual Assumption of Communications Message**

- Message to the transferring unit to indicate two-way RTF contact has been established with the flight

# Basic OLDI procedure.

# Prior to FIR entry

- At a predefined number of **minutes** prior to the COP, an **ABI** is sent.



SP time

*ABI*

**FIR (first sector)**

**Provides:**

**- Missing FPL data**
**- ABI + revisions**
**- SSR code to facilitate early correlation**
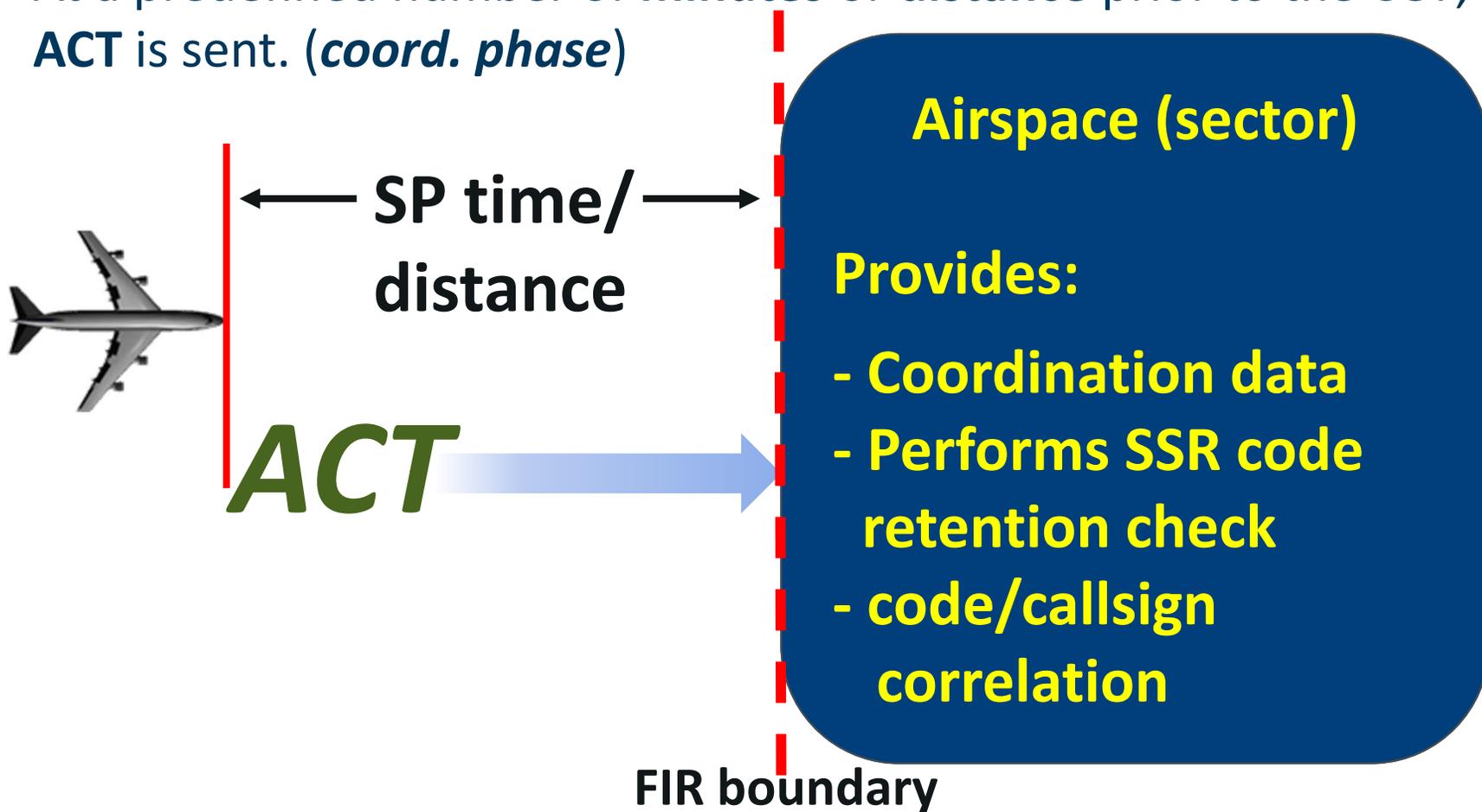
**FIR boundary**

# What is sent in response?

- **LAM** is returned.

If the information sent in the ABI needs to be updated, it is achieved by sending another ABI message containing the revised data.

# Prior to FIR entry

- At a predefined number of **minutes** or **distance** prior to the COP, an **ACT** is sent. (***coord. phase***)
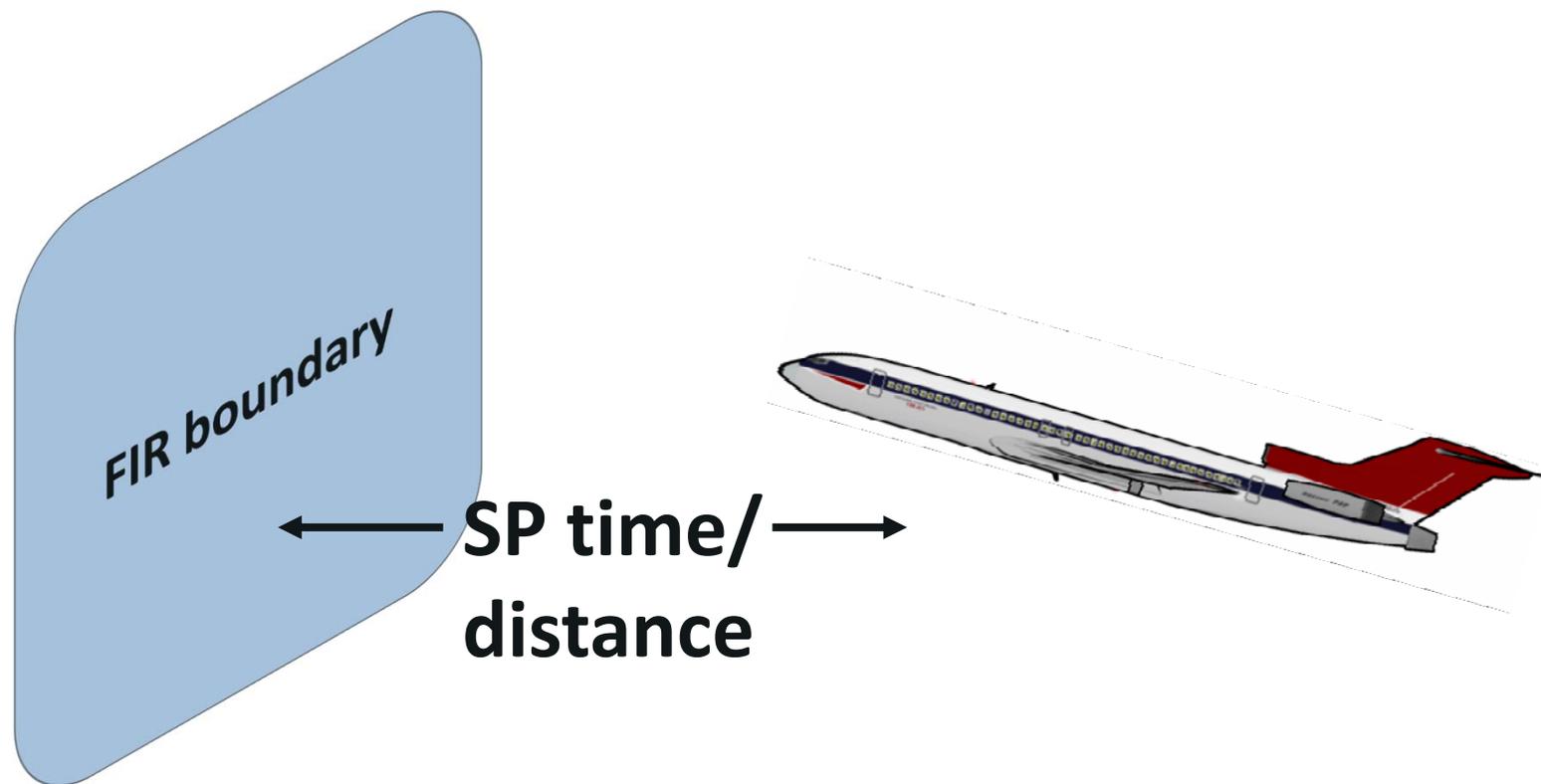
SP time/ distance

*ACT*

**Airspace (sector)**

**Provides:**

- **Coordination data**
- **Performs SSR code retention check**
- **code/callsign correlation**

**FIR boundary**

# What is sent in response?

- **LAM** is returned.

# What if the aircraft departs from too close to the COP to allow an ACT to be sent?



FIR boundary

← SP time/ →
distance

# Close to FIR entry

- A **PAC** is used. A **PAC** replaces the **ABI** and/or **ACT**.

←—— ACT time/ ——→
distance

*PAC*

**Airspace (sector)**

**Provides:**

**- notification or pre-departure coordination**
**- missing flight plan data**
*Can contain a SSR code request*
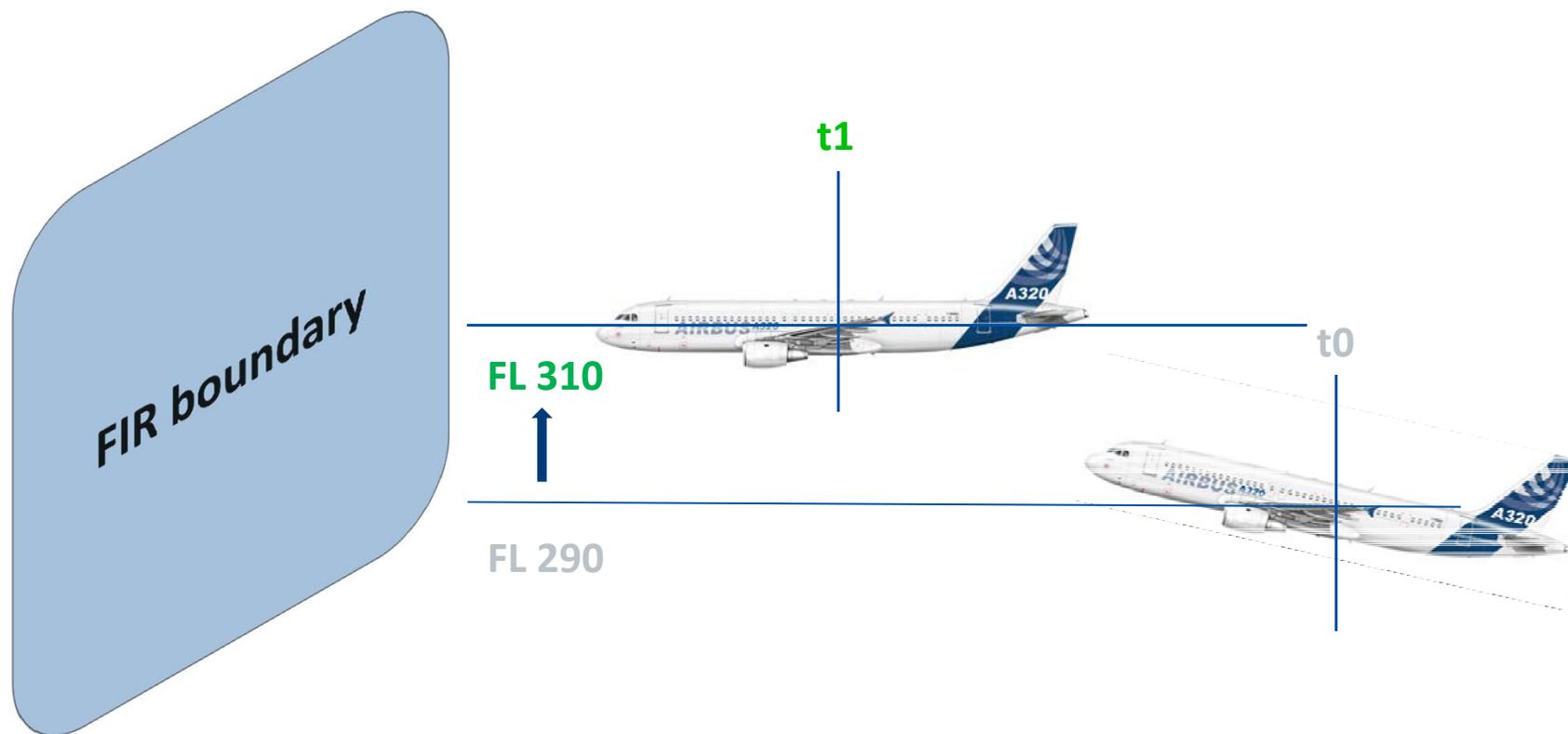
**FIR boundary**
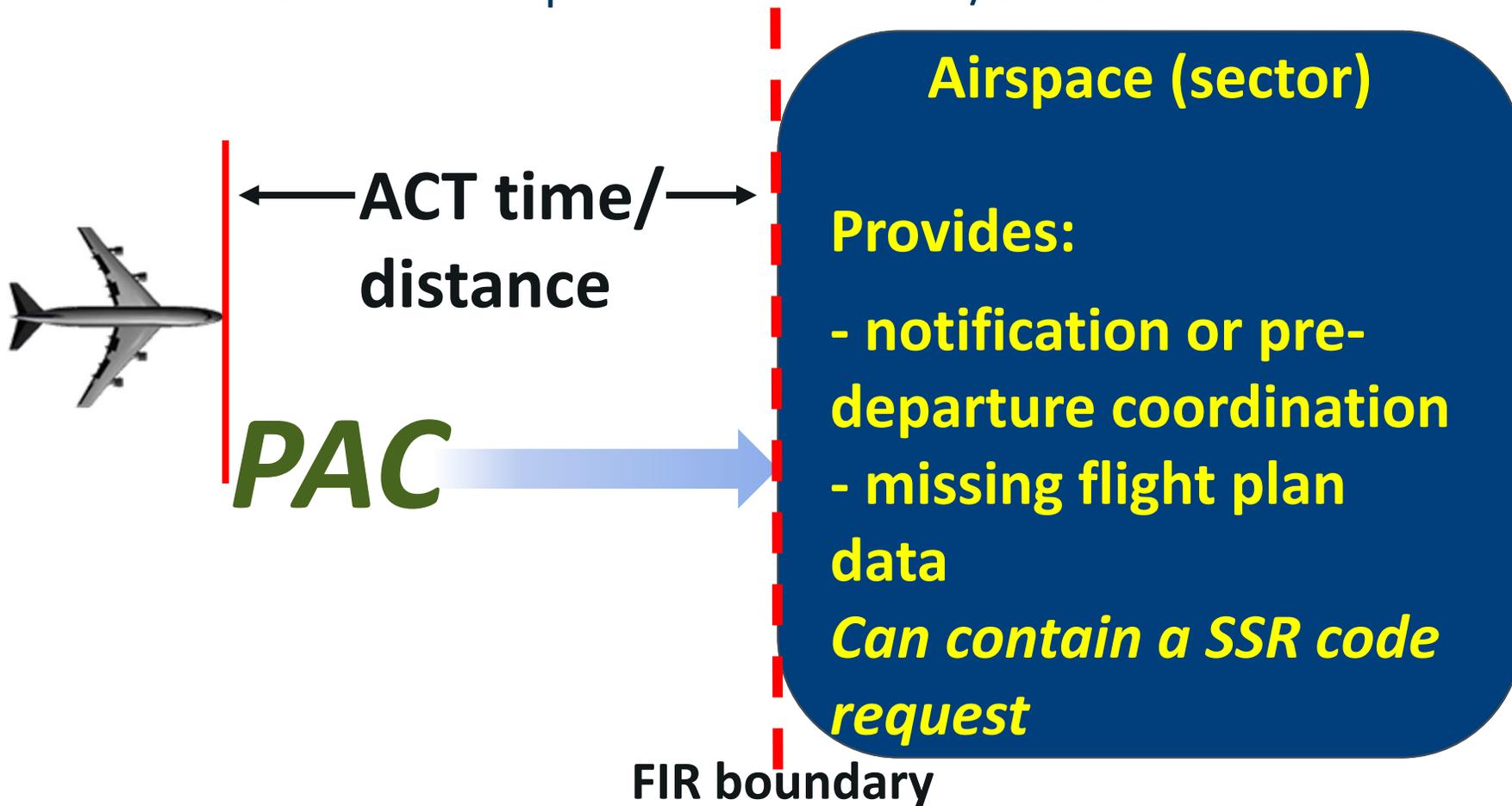
# PAC Messages

If the information sent in the **PAC** message provides an update of ETD but does not include coordination data it is treated like an **ABI** on reception.

If the **PAC** message contains coordination data (COP, ETO and TFL) it is treated similar to an **ACT** on reception.
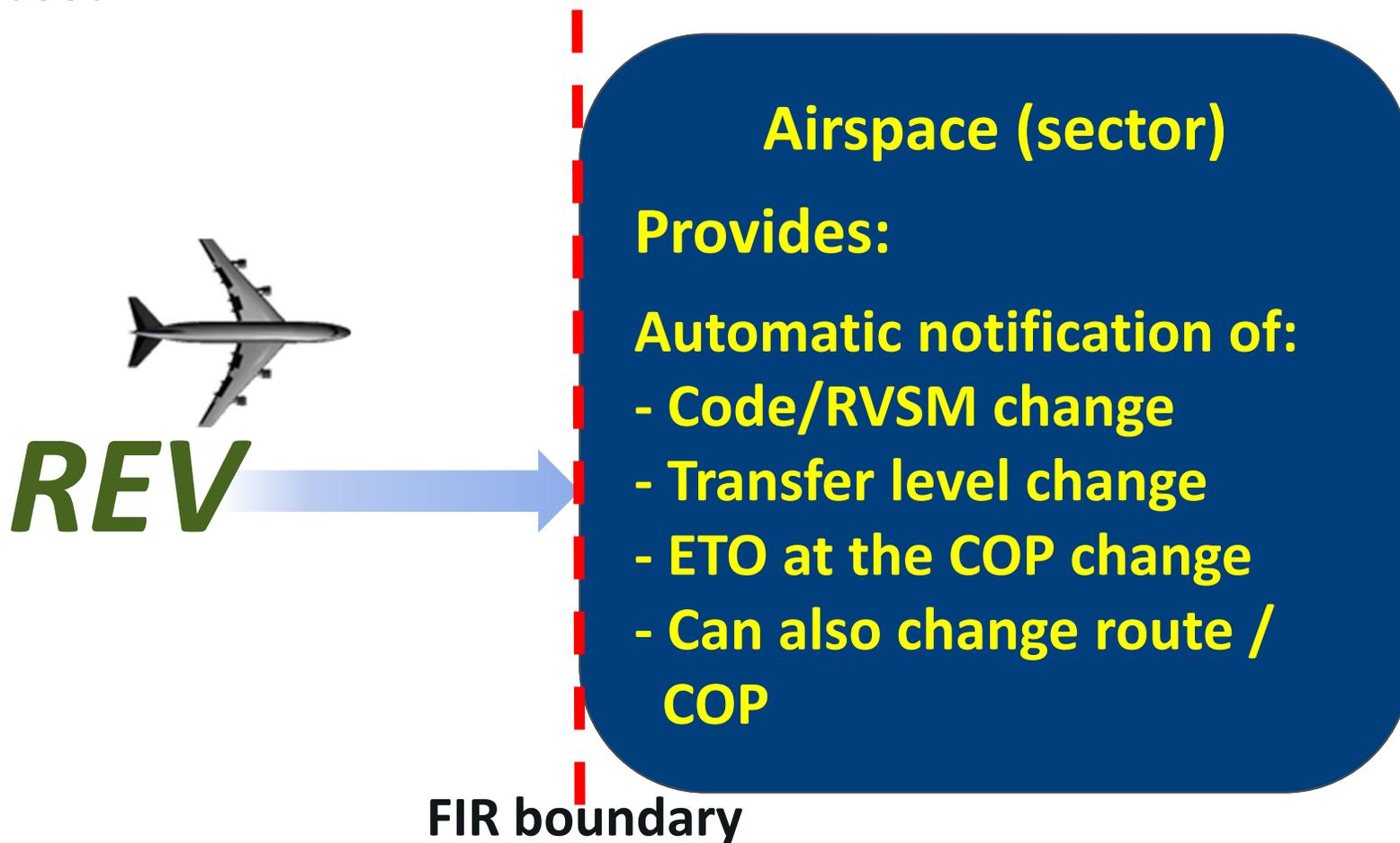
# What if revisions to coordination are required?

# Revision of coordination required

- A **REV** is used.

*REV*

**Airspace (sector)**

**Provides:**

**Automatic notification of:**
- **Code/RVSM change**
- **Transfer level change**
- **ETO at the COP change**
- **Can also change route / COP**

**FIR boundary**
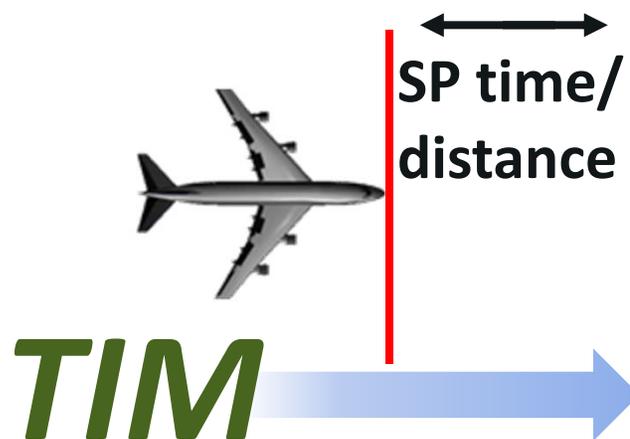
# What is sent in response?

- **LAM** is returned and a FPL created if the sector responsible for the control of the flight can be identified.

# Transfer of Communication and Control

# Transfer initiation

- At a predefined **distance** or **time** prior to the COP, a **TIM** is sent. If distance and time are set to 0, **TIM** is not automatically sent.

SP time/ distance

*TIM*

**Airspace (sector)**

**Signifies:**

**- end of coordination phase**

**- start of transfer phase**

**- forwards Executive Control data (AHDG, CFL, ASP) to the accepting controller**
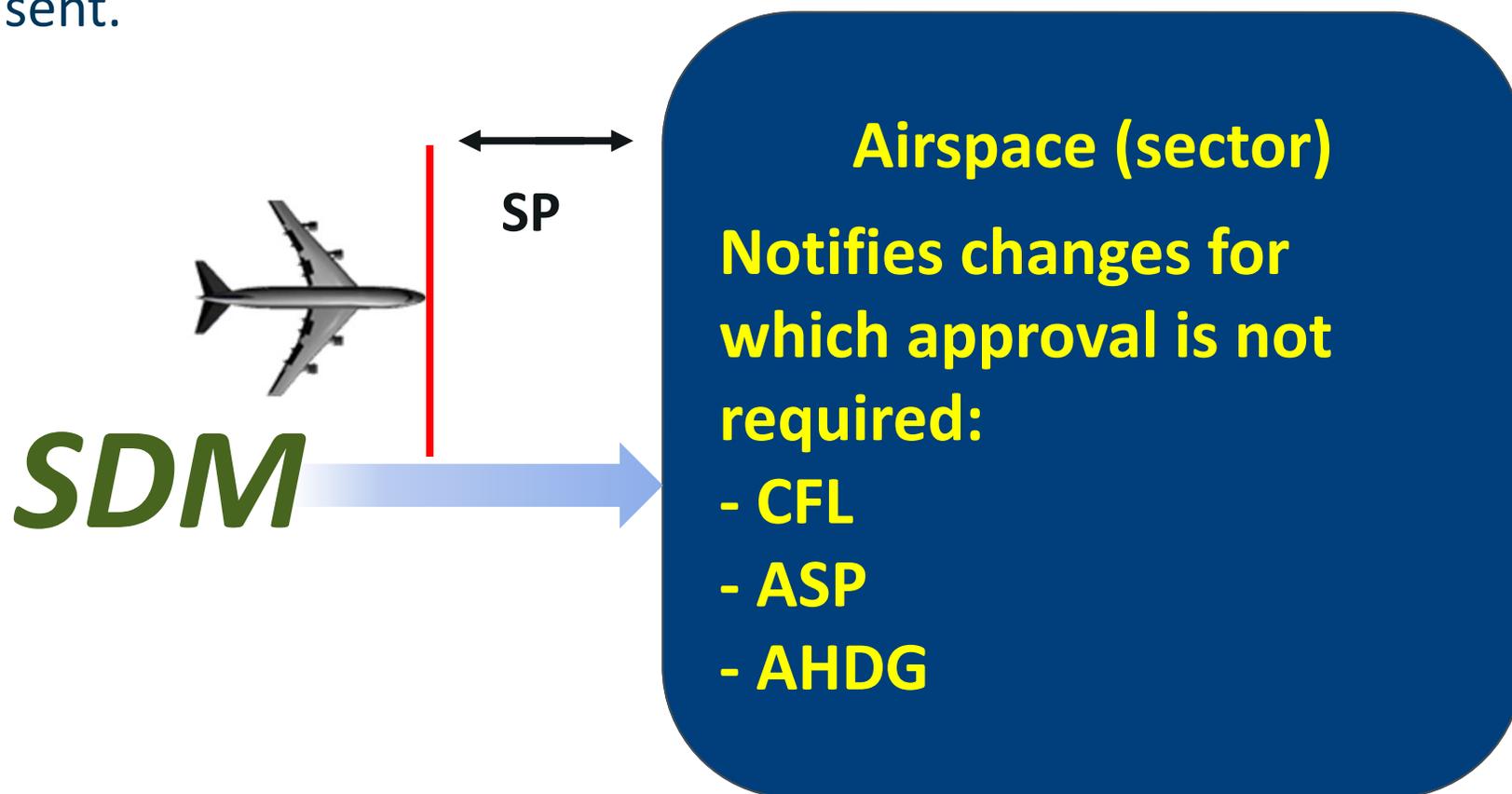
# What is sent?

- Not before the flight has been coordinated.

- Automatically at a (SP) distance/time from **COP out**.

- When the above SP's are set to '0', the **TIM** is not automatically sent.

- Regardless of the SP, **TIM** message sending is also triggered when on certain controller actions that will be covered later.

- A **TIM** is acknowledged by a **LAM**.

# Transfer initiation

- After the **TIM**, any changes to specific FDR fields result in a **SDM** being sent.

**SP**

*SDM*

**Airspace (sector)**

**Notifies changes for which approval is not required:**
**- CFL**
**- ASP**
**- AHDG**

# What is the last step?

- **COF** is sent.

# Transfer Completion

- A **COF** is sent on controller 'Transfer' input (not an automatic function).

*COF*

**Airspace (sector)**

**- Manually initiated**
**- A TIM is also sent if COF sent before the automatic TI event or if SPs for TIM sending are set to '0'**

# What is sent in response?

- **LAM** is returned.

# And finally...

- **MAS** may be manually initiated by the accepting controller.

- Not mandatory if a **COF** is used.

- Acknowledged by a **LAM**.

# Transfer Completion
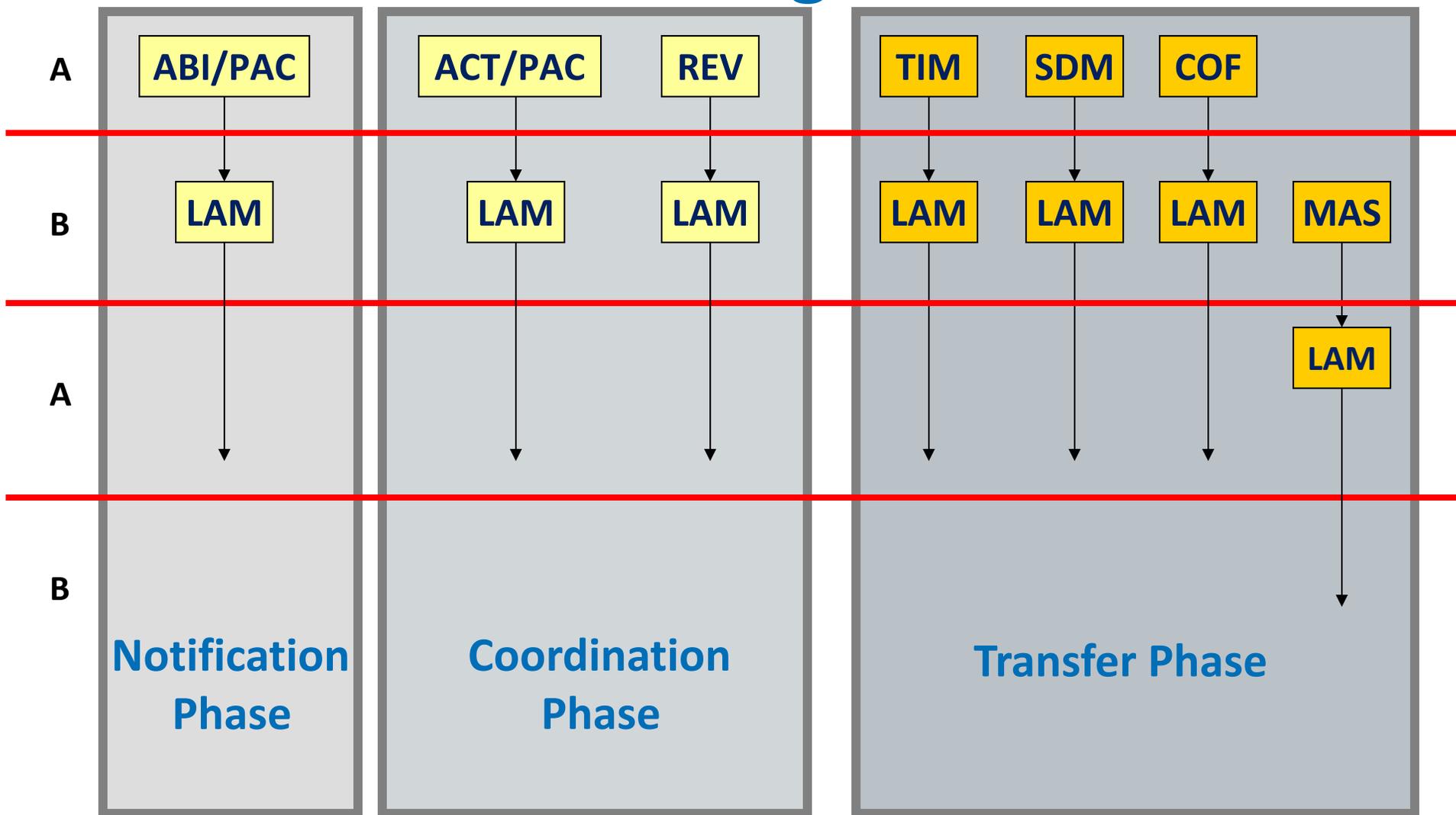
- A **MAS** is sent on controller 'Assume' input.

**Airspace (sector)**

**- Manually initiated**

*MAS*

# Standard OLDI Messages

# **OLDI Message Reception**

- Here is the process for handling OLDI messages.

# OLDI Message Reception

On reception a <u>syntax check</u> is performed.

- If error, put in OLDI Queue for manual processing.

After syntax check a <u>semantic</u> check is performed.

- If error, put in OLDI Queue for manual processing.

In both cases **LAM** is **<u>not</u>** sent.

When no error, further processing takes place :

- **LAM** sent: associate with previous message or

- if no previous message, a warning is displayed.

# OLDI Message Reception

No error - associated processing performed.

- **Successful** - Acknowledgement message sent.

- **Successful**: **ABI**, **PAC**, **ACT** - system tries to retrieve first controlling sector.

  - sector determined, acknowledgement message sent.

  - sector cannot be determined, message put in OLDI Queue, no acknowledgement message sent.

- **Unsuccessful** Other - put in OLDI Queue, no acknowledgement message sent.

# That completes:

## Basic SYSCO Principles and Standard OLDI Communication.

North American
Central American
and Caribbean
(NACC) Office
MexicoCity

South American
(SAM) Office
Lima

ICAO
Headquarters
Montreal

Western and
Central African
(WACAF) Office
Dakar

European and
North Atlantic
(EUR/NAT) Office
Paris

Middle East
(MID) Office
Cairo

Eastern and
Southern African
(ESAF) Office
Nairobi

Asia and Pacific
(APAC) Office
Bangkok

# Thank You