



**INTERNATIONAL CIVIL AVIATION ORGANIZATION**  
**AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP**  
**SEVENTEENTH MEETING (APIRG/17)**  
**(Burkina Faso, 2 to 6 August 2010)**

**Agenda Item 3:-Air Navigation Planning and Implementation Issues**

**3.3 Communications, Navigation and Surveillance (CNS)**

**USER REQUIREMENTS FOR AIR TRAFFIC SERVICES**

*(Presented by the International Air Transport Association)*

**Summary**

This working paper defines user requirements for air traffic services between now and the 2020 timeframe, and provides IATA's positions on CNS technologies and applications widely available or under consideration, together with a planning checklist for the implementation of a new technology.

It also suggests timelines for the commissioning of the newer technologies and the decommissioning of the older technologies.

IATA recommends that AFI States, APIRG and implementation coordination groups (ICGs) incorporate these requirements when developing regional and national implementation strategies for CNS/ATM elements.

Reference:

- ICAO Global Air Navigation Plan (Doc 9750)

**1. INTRODUCTION**

1.1. As a contribution to ICAO recommended collaborative decision making (CDM), IATA has compiled User Requirements for Air Traffic Services to offer guidance to Air Navigation Service Providers (ANSPs), States, vendors and funding organizations on international airline infrastructure requirements for air traffic services between now and the 2020 timeframe.

1.2. These requirements are meant to serve as a planning tool, and represent the consolidated view of IATA's members, which comprise some 230 airlines – the world's leading passenger and cargo airlines among them - representing 93 percent of scheduled international air traffic.

1.3. Due account is taken of technologies widely available or under consideration to provide Communications, Navigation and Surveillance (CNS) for Air Traffic Management (ATM), and recommendations are based on the evaluation of operational benefits, e.g. schedule, safety, efficiency, cost, risk, and availability.

## 2. DISCUSSION

### *Position on CNS / ATM Infrastructure*

2.1. In general, IATA's position on short to midterm CNS/ATM infrastructure improvements is to support the implementation of the following technologies where operationally feasible and supported by an agreed business case in consultation with airlines:

- Voice migrating to data link as the primary means of controller-pilot communication while continuing the provision of voice communication as a backup and for non-routine communications
- Performance Based Navigation (PBN), enabled by GNSS as the primary radio navigation aid for all phases of flight
- Surveillance based primarily on Automatic Dependent Surveillance Broadcast (ADS-B) and when required supplemented with Multilateration (MLAT) as the next generation replacement to radar.

2.2. The following table summarizes IATA's position on current CNS/ATM Infrastructure technologies and applications, while figures 1-3 offer suggested timelines for the commissioning the newer technologies and the decommissioning of the older technologies.

<b>Communications</b>	<b>Support where justified</b>	<b>Maintain during transition</b>	<b>Do NOT support or support in limited cases</b>
AFTN		X	
AMHS	X		
VSAT	X		
AIDC	X		
VHF Voice 8.33 KHz Channel Spacing	X		
HF Voice	X		
SatCom	X		
IRIDIUM	X		
HFDL	X		
ACARS	X		
VDL Mode 2	X		
VDL Mode 3			X
VDL Mode 4			X
CPDLC	X		
ATN	TBD		

<b>Navigation</b>	<b>Support where justified</b>	<b>Maintain during transition</b>	<b>Do NOT support or support in limited cases</b>
PBN	X		
WGS-84	Essential		
DME	X		
ILS	X		
MLS			X
NDB			X
TACAN			X
VOR		X	
GNSS	X		
ABAS	X		
GBAS	X		
SBAS			X

<b>Surveillance</b>	<b>Support where justified</b>	<b>Maintain during transition</b>	<b>Do NOT support or support in limited cases</b>
PSR			X
SSR Mode A/C		X	
SSR Mode S	X		
PAR			X
ADS-B OUT	X		
ADS-B IN	X		
ADS-C	X		
TIS-B		X	
MLAT	X		

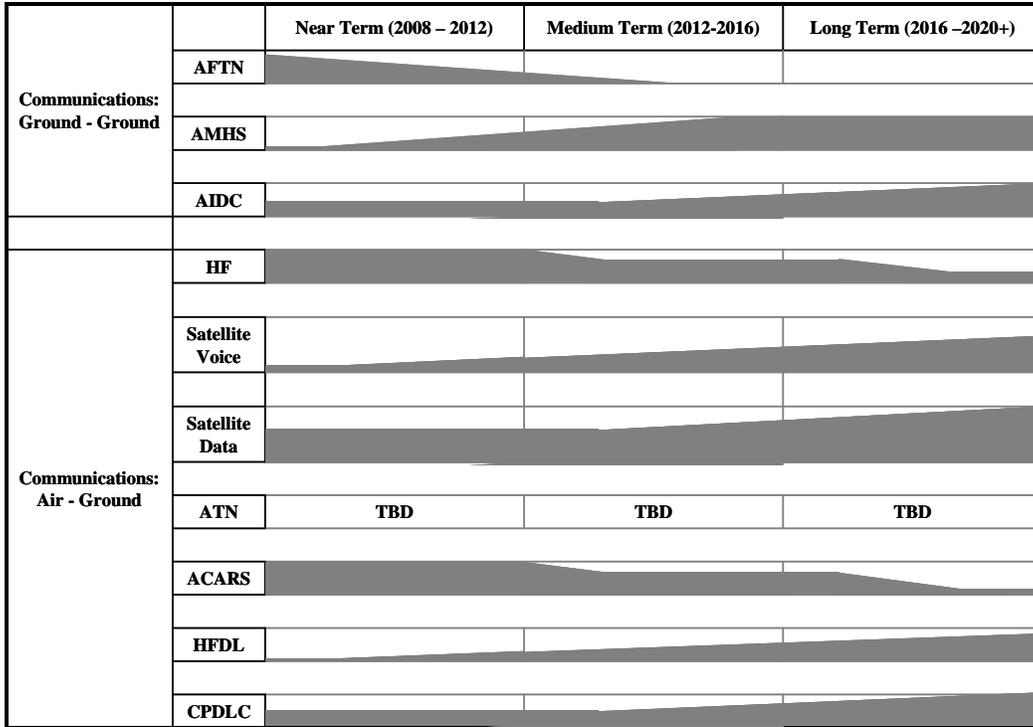
<b>Candidate ADS-B Data Links</b>	<b>Support where justified</b>	<b>Maintain during transition</b>	<b>Do NOT support or support in limited cases</b>
1090 ES	X		
VDL Mode 4			X
UAT			X

<b>Other Data Link Services</b>	<b>Support where justified</b>	<b>Maintain during transition</b>	<b>Do NOT support or support in limited cases</b>
D-ATIS	X		
AWOS	X		
PDC	X		

*Transition Roadmap*

2.3. Infrastructure should have timelines for commissioning and decommissioning. An approximate transition roadmap through the 2020 timeframe is depicted in figures 1 through 3 and table 1.

**Figure 1. Communications Roadmap (present )**



**Figure 2. Navigation Roadmap (present – 2020).**

		Near Term (2008 – 2012)	Medium Term (2012-2016)	Long Term (2016 –2020+)
<b>Navigation: Ground- Based Aids</b>	<b>DME</b>	[Shaded area decreasing from 2008 to 2016]		<b>TBD</b>
	<b>ILS</b>	[Shaded area decreasing from 2008 to 2016]		
	<b>MLS</b>	[Shaded area decreasing from 2008 to 2016]		
	<b>NDB</b>	[Shaded area decreasing from 2008 to 2016]		
	<b>VOR</b>	[Shaded area decreasing from 2008 to 2016]		
	<b>PBN</b>	[Shaded area increasing from 2008 to 2020+]		
	<b>WGS-84</b>	<b>ICAO STANDARD (Should be Implemented and Updated)</b>		
<b>Navigation: Satellite / GNSS</b>	<b>GNSS</b>	[Shaded area increasing from 2008 to 2020+]		
	<b>ABAS</b>	[Shaded area increasing from 2008 to 2020+]		
	<b>GBAS</b>	[Shaded area increasing from 2008 to 2020+]		
	<b>SBAS</b>	[Shaded area increasing from 2008 to 2020+]		

**Figure 3. Surveillance Roadmap (Present – 2020)**

		Near Term (2008 – 2012)	Medium Term (2012-2016)	Long Term (2016 –2020+)
<b>Surveillance: Radar</b>	<b>PSR En- Route</b>	[Shaded area decreasing from 2008 to 2016]		
	<b>PSR TMA</b>	[Shaded area decreasing from 2008 to 2020+]		
	<b>SSR En- Route</b>	[Shaded area decreasing from 2008 to 2020+]		
	<b>SSR TMA</b>	[Shaded area decreasing from 2008 to 2020+]		
<b>Surveillance: Automatic Dependent Surveillance &amp; MLAT</b>	<b>ADS-B OUT</b>	[Shaded area increasing from 2008 to 2020+]		
	<b>ADS-B IN</b>	[Shaded area increasing from 2008 to 2020+]		
	<b>ADS-C</b>	[Shaded area increasing from 2008 to 2020+]		
	<b>MLAT</b>	[Shaded area increasing from 2008 to 2020+]		

### *Planning Checklist*

2.4. Some of the questions that ANSPs, States and international funding organizations need to answer when planning for the implementation of new technology are:

- What are the current and forecast requirements of airlines?
- What are the benefits of this technology to airlines in terms of safety, schedule maintenance, operation and efficiency?
- What is the timeline for realization of benefits and technology transition?
- What are the system and infrastructure requirements as well as the policies and procedures necessary to enable full realization of technology benefits?
- What is the cost to airlines in terms of increased air navigation and communication fees, on-board equipment, aircraft down time, training, maintenance, etc?
- When do these benefits recover the associated costs?
- Does the technology meet existing international standards? If new standards are required, will they be ready within an appropriate timeframe?
- Is the investment consistent with international planning, and does it contribute to seamlessness of regional and global airline operations?
- Does the technology represent the most effective use of resources?
- Is the purchase consistent with an incremental approach to technology deployment that promises early benefits to airlines and a path to future benefits?
- Are neighbouring ANSPs and States willing to consider sharing common infrastructure projects in order to save costs and promote seamless operations?

## **3. CONCLUSION**

3.1. The meeting is invited to:

- a) Note the user requirements for air traffic services between now and the 2020 timeframe;
- b) Note IATA's positions on CNS technologies and applications, planning checklist and suggested timelines for the commissioning of the newer technologies and the decommissioning of the older technologies; and
- c) Request AFI States, Air Navigation Service Providers, Regional Planning/Implementation bodies and Implementation Coordination Groups (ICGs) to take due account of user requirements for air traffic services when developing regional and national implementation strategies for CNS/ATM system elements, in line with ICAO recommended collaborative decision making (CDM).

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