



ICAO DAKAR UNITING AVIATION

PBN Implementation for safety and efficiency enhancement in the AFI region- *Requirements and status of PBN implementation*

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Presentation Outline

- ICAO Assembly Resolution
 - APIRG Conclusions
 - AFI PBN Plan and Timelines
 - Status of Implementation
 - AFI ANS Performance Indicators & Targets (PBN)
 - » Way Forward/AFPP





ICAO Assembly Resolution A 37-11 Performance-based navigation global goals

- Urges all States to implement RNAV and RNP air traffic services (ATS) routes and approach procedures in accordance with the ICAO PBN concept laid down in the Performance-based Navigation (PBN) Manual (Doc 9613)
- PBN Route Network Development Work-Group
- Number of PBN Routes development/implemented
- Carbon Saving



- a) States complete a PBN implementation plan as a matter of urgency to achieve:
 - 1) implementation of RNAV and RNP operations (where required) for en route and terminal areas according to established timelines and intermediate milestones;
 - 2) implementation of approach procedures with vertical guidance (APV) (Baro-VNAV and/or augmented GNSS), including LNAV-only minima, for all instrument runway ends, either as the primary approach or as a back-up for precision approaches by 2016 with intermediate milestones as follows: 30 per cent by 2010, 70 per cent by 2014
 - 3) implementation of straight-in LNAV-only procedures, as an exception to 2) above, for instrument runways at aerodromes where there is no local altimeter setting available and where there are no aircraft suitably equipped for APV operations with a maximum certificated take-off mass of 5 700 kg or more;



- A 37-11
- b) ICAO develop a plan to assist States in the implementation of PBN; ensure development of SARPs, Procedures for Air Navigation Services (PANS); and Guidance Material; including a global harmonized safety assessment methodology to keep pace with operational demands;
- 3. States include in PBN implementation plan provisions for Approach Procedures with Vertical Guidance (APV) to all runway ends serving aircraft with a maximum certificated take-off mass of 5700 kg or more, according to established timelines and intermediate milestones;



- 4. Instructs the Council to provide a progress report on PBN implementation
- 5. Requests the Planning and Implementation Regional Groups (PIRGs) to include status of implementation of PBN by States in their work programme and report annually to ICAO any deficiencies that may occur; and



- **APIRG CONCLUSION 17/47: NATIONAL PBN IMPLEMENTATION PLAN**
- That States:
- (a) Use the Regional PBN implementation plan template to develop national PBN implementation plan
- (b) Provide feedback to the ESAF and WACAF Regional Offices by 30 October 2010 regarding progress in the development of their national plans, indicating any challenges, if any, that are delaying the development of the plan, as well as measures taken or to be taken to overcome such challenges.



CONCLUSION 17/54: PBN ENABLING LEGISLATION

- That, AFI States that have not already done so, include in their legislation and/or regulations provisions to enable the implementation of PBN.



CONCLUSION 17/55: PARTICIPATION OF REPRESENTATIVES OF STATES INVOLVED IN PBN APPROVAL PROCESS

- That, to support the PBN planning and implementation processes, AFI States include experts and officials involved in the PBN approval process of aircraft operators to meetings.

CONCLUSION 17/56: FUNDING OF THE PBN IMPLEMENTATION PROGRAMME

- That, regulatory bodies, operators, service providers and other stakeholders be granted budgetary allocations for acquisitions and other activities necessary for ensuring that all the requirements be met in a timely manner in order to safely implement PBN in the AFI Region.



- CONCLUSION 17/58: NATIONAL PBN PROGRAMME MANAGERS (NPPM)

That, to facilitate PBN implementation and Regional coordination:

- a) AFI States nominate/designate NPPMs as soon as possible and assign them the terms of reference and provide ICAO with contact details of the NPPMs;
- b) States update the NPPMs contact information provided to ICAO whenever changes have been made.



CONCLUSION 17/59: AIRSPACE PLANNING AND AIRCRAFT EQUIPMENT SURVEY

That, in order to facilitate airspace planning and decisions related to ANS infrastructure:

- a) ICAO coordinates with IATA and AFRAA conduct surveys on aircraft equipage
- b) AFI States and ANSPs to support the ICAO/IATA global survey on aircraft equipment
- c) AFI States make efforts to bring awareness to the aircraft operators; and
- d) AFI States ensure that initiatives for air navigation system enhancements are matched with fleets capabilities and readiness.



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ESAF	WACAF
63%	50%
Total % Plan PBN	Total % Plan PBN

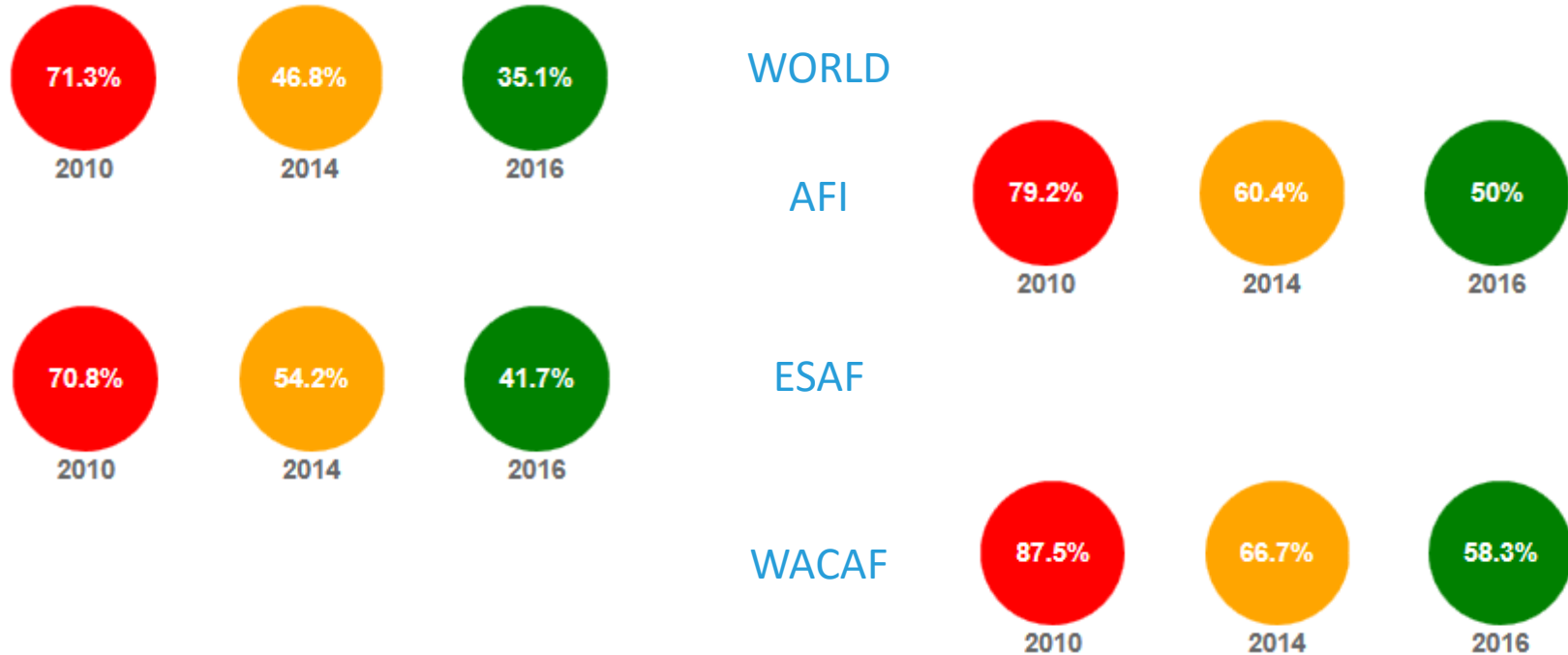


Data issued by ICAO Regional Offices, States, and AFCAC/ICAO Survey, May 2015





Percentage of States meeting the Resolution Targets for Applicable Years





States in the world

193

PBN Runway Ends

2059

Instr. Runway Ends

3443

PBN Runway Ends (%)

59.8%

WORLD

AFI

States in AN Region-AFI

48

PBN Runway Ends

130

Intr. Runway Ends

181

PBN Runway Ends (%)

71.8%

States in ESAF

24

PBN Runway Ends

47

Intr. Runway Ends

76

PBN Runway Ends (%)

61.8%

ESAF

WACAF

States in WACAF

24

PBN Runway Ends

83

Intr. Runway Ends

105

PBN Runway Ends (%)

79%

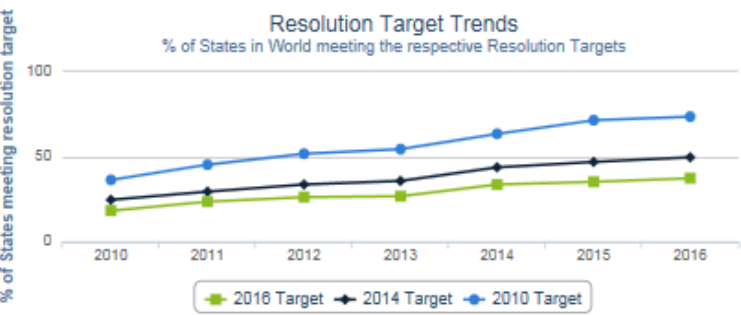


WORLD

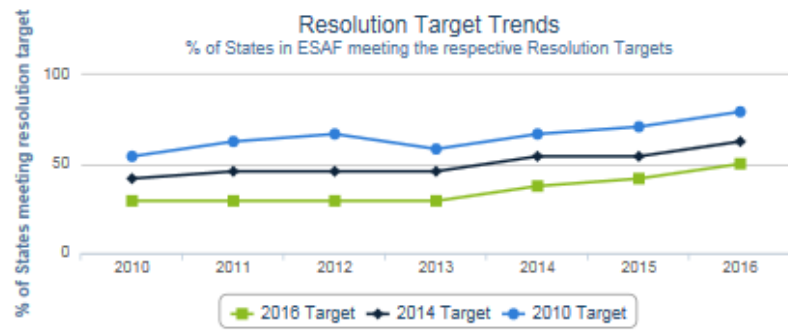
Resolution Target Trends

ESAF

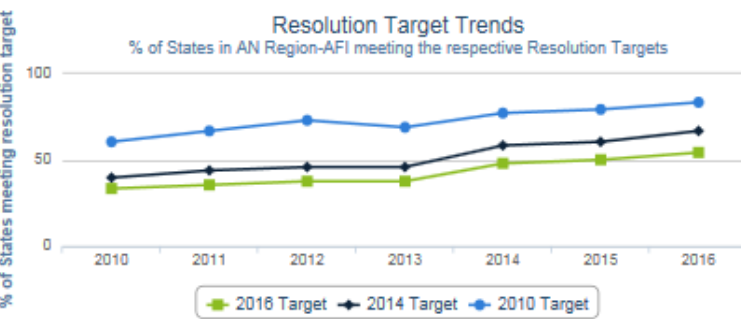
Resolution Target Trends
% of States in World meeting the respective Resolution Targets



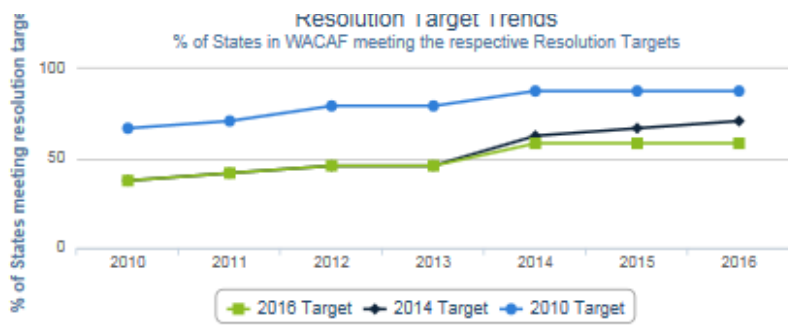
Resolution Target Trends
% of States in ESAF meeting the respective Resolution Targets



Resolution Target Trends
% of States in AN Region-AFI meeting the respective Resolution Targets



Resolution Target Trends
% of States in WACAF meeting the respective Resolution Targets



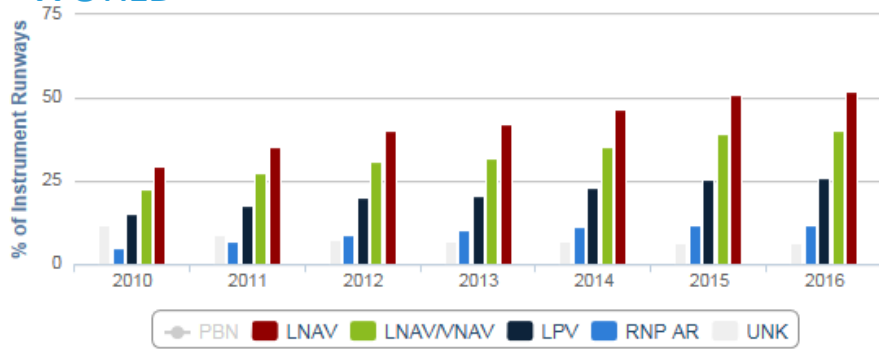
AFI

WACAF



WORLD

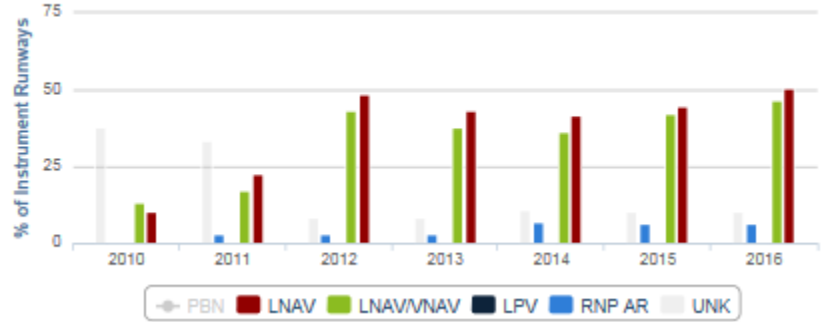
PBN Trends
% of PBN Runways by type for World



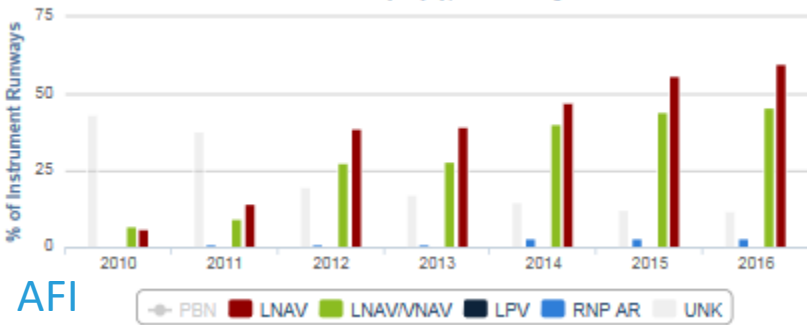
PBN Trends

PBN Trends
% of PBN Runways by type for ESAF

ESAF

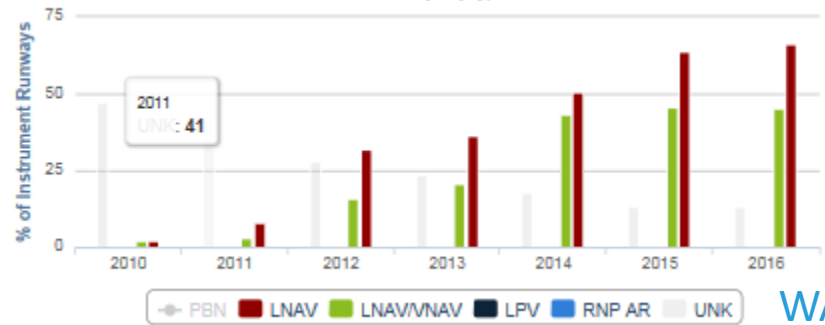


PBN Trends
% of PBN Runways by type for AN Region-AFI



AFI

PBN Trends
% of PBN Runways by type for WACAF



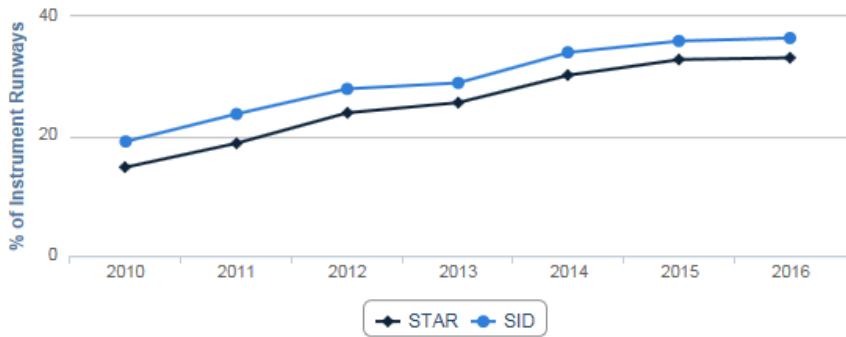
WACAF



WORLD

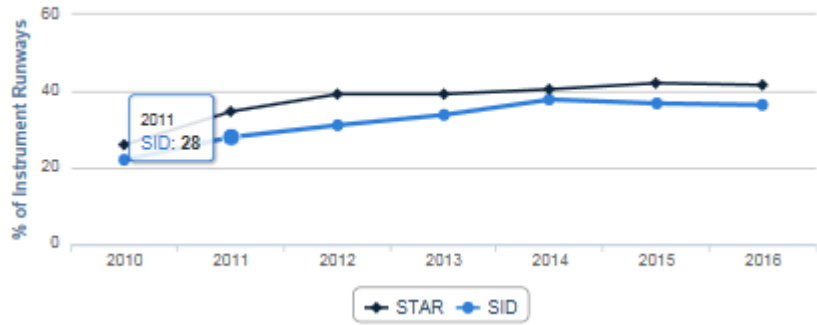
SID/STAR Trends
% of SID/STAR Runways for World

SID/STAR Trends



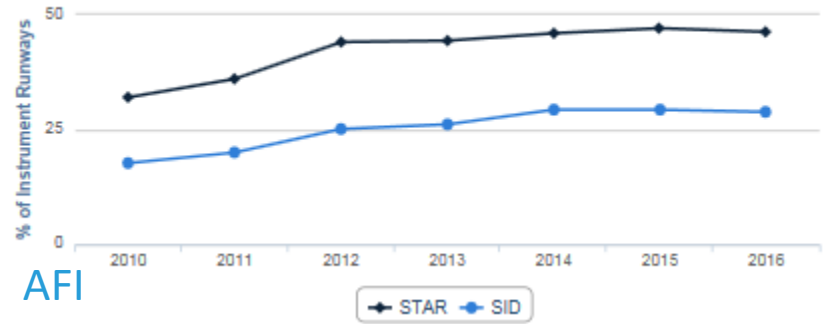
ESAF

SID/STAR Trends
% of SID/STAR Runways for ESAF

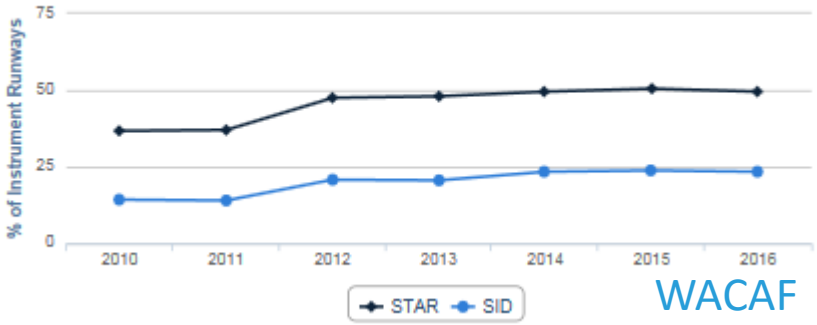


AFI

SID/STAR Trends
% of SID/STAR Runways for AN Region-AFI



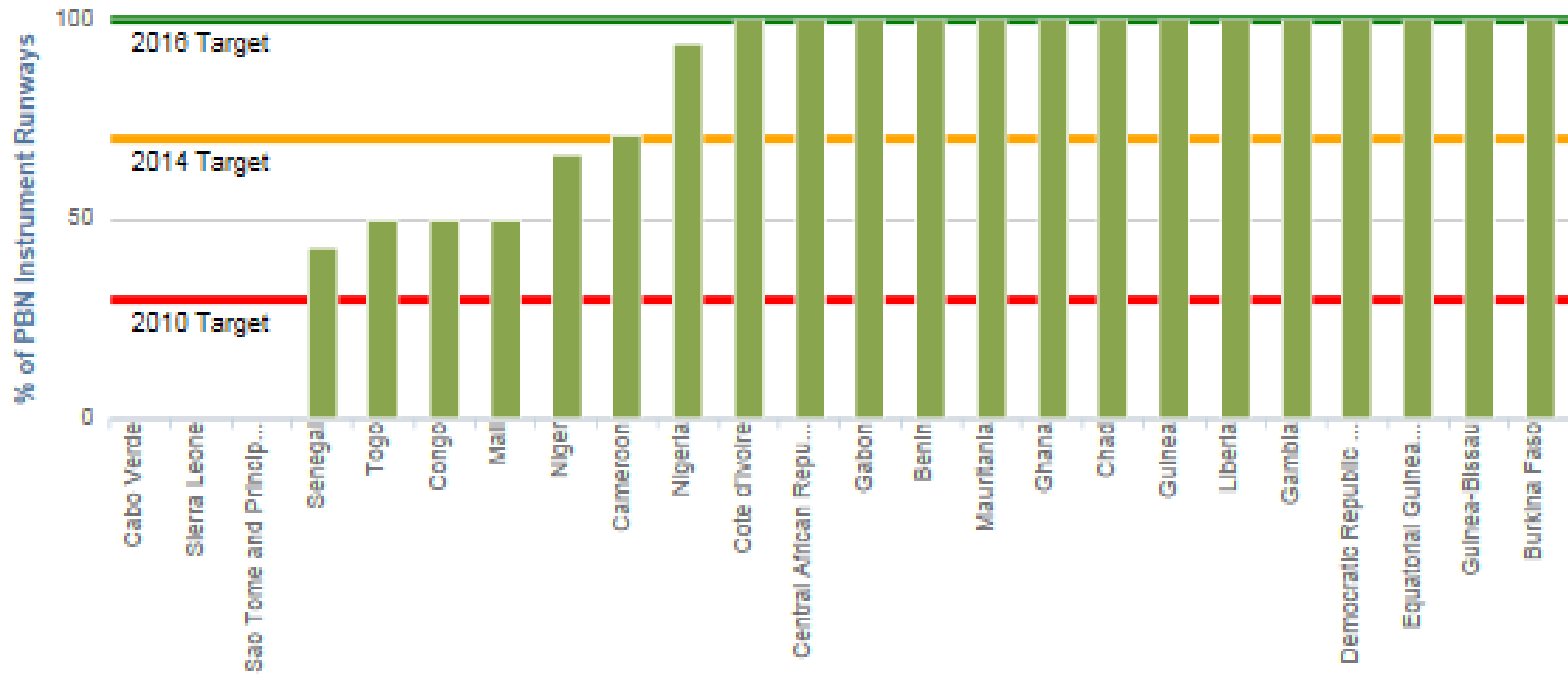
SID/STAR Trends
% of SID/STAR Runways for WACAF



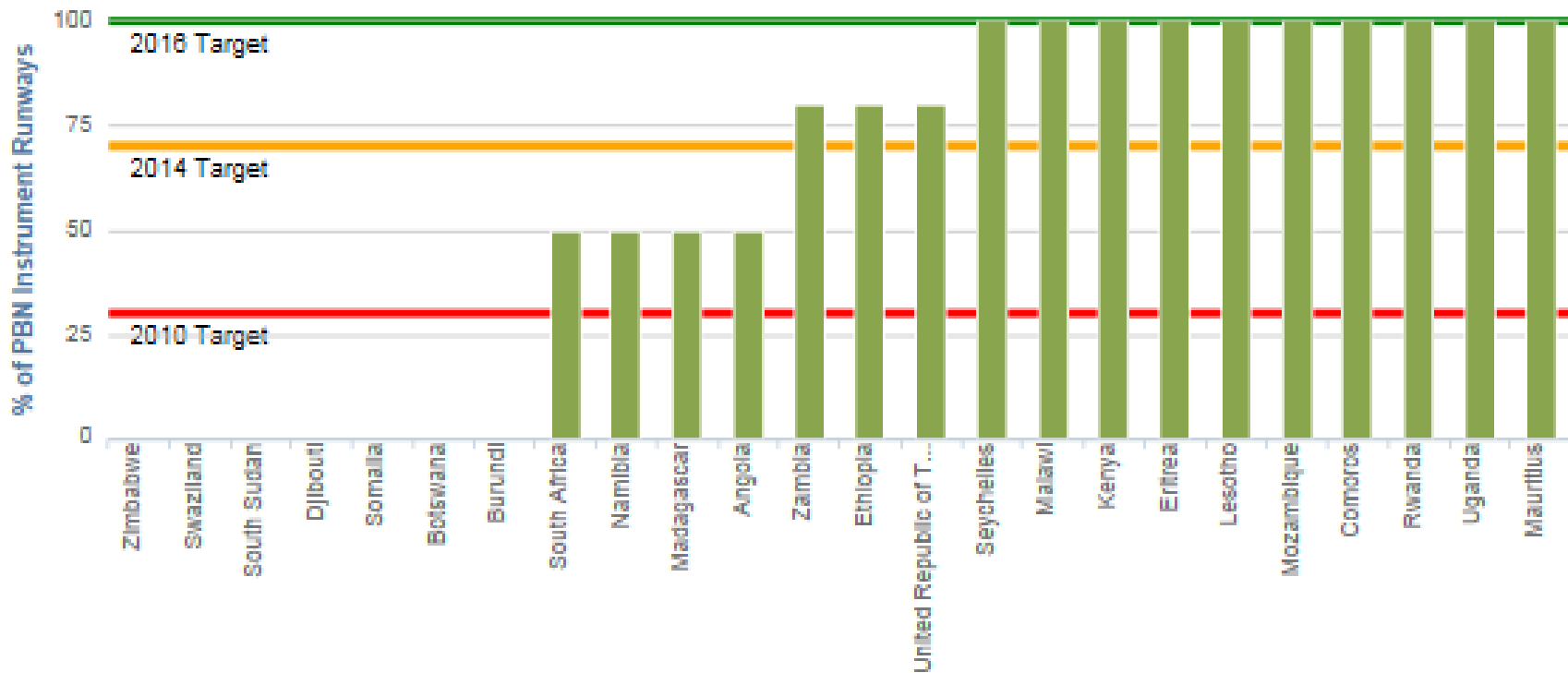
WACAF



Regional PBN Implementation
% of PBN Runways per Country for WACAF



Regional PBN Implementation
% of PBN Runways per Country for ESAF





Air Navigation Services (ANS) Key Performance Indicators and Targets adopted by APIRG/20 Meeting

Implement ICAO Aviation System Block Upgrades (ASBUs) Block-0 Modules by 2018

- **Establish and update national PBN plans by 2016**
- Implement all applicable elements of PBN by 2018
- Implement Continuous Descent Operations /Continuous Climb Operations (CDO/CCO) by 2018



- PBN reflects ICAO's 5 Strategic Objectives
 - **Safety**
 - **Efficiency and Capacity**
 - **Security**
 - **Economy**
 - **Environment**
- PBN is number ONE AN Priority



Australia turns to GNSS for primary navigation

- 179 ground-based navigation aids and associated non-precision approach procedures will be withdrawn from service this week. Australia earlier this year mandated the use of satellite navigation technology;
- The move on 26 May will see the Airservices Navigation Rationalisation Project switch-off 179 navigation aids, including non-directional beacons, VHF Omni-directional radio ranges and distance measuring equipment;
- Australia's Civil Aviation Safety Authority also required from 4 February that instrument flight rules (IFR) aircraft use Global Navigation Satellite System (GNSS) technology as their primary means of navigation.
- Airservices consulted extensively on the changes and in May issued three types of Notices to Airmen (NOTAMS) alerting operators to the progressive shutdown from 4am (AEST) on 26 May.



- The navaid information has been removed from Aeronautical Information Publications in the 26 May edition.
- Benefits of the switch to satellite navigation include a reduced requirement to use ground-based aids, greater operational flexibility, and reduced track miles, step-down and circling approaches, as well as reduced fuel burn and flight times.
- Airservices will monitor the remaining 213 navigation aids forming the **industry-selected Backup Navigation Network (BNN)** which will be available in the unlikely event a pilot is unable to access the satellite service.



WAY FORWARD

- **THE AFPP, YOUR PARTNER FOR PBN IMPLEMENTATION**



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ICAO

North American
Central American
and Caribbean
(NACC) Office
Mexico City

South American
(SAM) Office
Lima

ICAO
Headquarters
Montréal

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) Sub-office
Beijing

Asia and Pacific
(APAC) Office
Bangkok



THANK YOU