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North American, Central American and Caribbean Office (NACC)
Oficina para Norteamérica, Centroamérica y Caribe (NACC)

NAM/CAR/SAM Workshop on the Development of the regulation for the implementation of Automatic Dependent Surveillance – Broadcast (ADS-B)
17-21 July 2023 / 17-21 julio de 2023

ADS-B IMPLEMENTATION ACTION PLAN
PROJECT PLAN DEVELOPMENT

ADS-B IMPLEMENTATION		
Why? the main purpose is that it provides a summary of the essence of the element for the operational elements, it provides information of the direct relationship of the performance.	**What?** description of what stakeholders can do with this element that could not be done before. This section is not intended to describe performance enhancement or benefits	**How?** additional information to improve the understanding of the element.
- Define Objective	- Define Stakeholders - Integrate all stakeholders in the project. - Define action plan. - Define benefits	- Case study - Technical evaluation - Risk analysis - Cost benefit - Business and Safety case - Schedule - Implementation Strategy - Others
Relationship of the performance (Key performance indicators)		
"What cannot be measured cannot be improved"		
KPI01 **Departure punctuality** **KPI02** **Taxi-out additional time** **KPI03** **ATFM slot adherence** **KPI04** **Filed flight plan en-route extension.** **KPI05** **Actual en-route extension** **KPI06** **En-route airspace capacity** **KPI07** En-route ATFM delay **KPI08** **Additional time in terminal airspace**	KPI09 Airport peak capacity KPI10 Airport peak throughput KPI11 Airport throughput efficiency KPI12 Airport/Terminal ATFM delay KPI13 Taxi-in additional time KPI14 Arrival punctuality KPI15 Flight time variability KPI16 Additional fuel burn	KPI17 Level-off during climb KPI18 Level capping during cruise KPI19 Level-off during descent KPI20 Number of aircraft accidents KPI21 Number of runway incursions KPI22 Number of runway excursions KPI23 Number of airprox/TCAS alert/loss of separation/near midair collisions/midair collisions (MAC)
https://www4.icao.int/ganpportal/ASBU/KPI		

ADS-B ENABLES		
1. Infrastructure		
Ground system infrastructure: The type of infrastructure to be implemented can depend on different factors (e.g., Terrain, operational requirements, coverage requirements, avionics compatibility, etc.)		
Element	**Technical Needs**	**Standards and technical information to incorporate in the analysis**
ADS-B ground stations receive information from aircraft and transmit it to one or more Service	- Technical requirements - Evaluation terrain - Communication needs (main and backup needs) - Energy needs - Security - maintenance logistics - Others according with implementation	- ICAO Annex 10 Volume IV Chapter 2,3 and 5 - ICAO Doc. 9871 Technical Provisions for Mode S Services and Extended Squitter - RTCA/EUROCAE MOPS: DO-260/ED-102, DO-260A, or DO-260B/ED-102A EUROCAE ED-129, ED-129A or ED-129B - ICAO Doc. 9924 Aeronautical Surveillance Manual
Service Delivery Point(s) for ADS-B information	- Technical requirements - ATC integration protocols - Surveillance system purpose and scope - Definition of parameters contributing to quality of services - Components of an aeronautical surveillance system - Definition of parameters contributing to quality of services. - Monitoring System. - Surveillance data evaluation - ATC Alarms	- ICAO Doc. 9924 Aeronautical Surveillance Manual. - ICAO Doc. 4444 PANS ATM
Human Machine Interface (HMI) of the Air Traffic Controller Working Position (ATCo CWP)	- Integrate technical language. - Integrate in the HMI operational requirements. - Integrate HMI for technical needs.	- ICAO Doc. 9924 Aeronautical Surveillance Manual. - ICAO Doc. 4444 PANS ATM
2. Aircraft Avionics		
SSR Mode S transponder with extended squitter version 0, version 1 and version 2.	Three versions of ADS-B: - Version 0 = DO-260/ED-102 - Version 1 = DO-260A - **Version 2 = DO-260B/ED-102A**	- ICAO Annex 10 Volume IV Chapter 2,3 and 5 - ICAO Doc. 9871 Technical Provisions for Mode S Services and Extended Squitter - RTCA/EUROCAE MOPS: DO-260/ED-102, DO-260A, or DO-260B/ED-102A - ICAO Doc. 9924 Aeronautical Surveillance Manual
Basic Aviation GNSS receiver with RAIM *Receiver autonomous integrity monitoring (RAIM)	Position source. Basic Aviation GNSS receiver with RAIM. RAIM. Receiver autonomous integrity monitoring (RAIM) provides integrity monitoring of GPS for aviation	- Technical performance requirements of either [E]TSO-C129, or [E]TSO-C196, or [E]TSO-C145/-C146. (Note that the US/Europe and equivalent ADS-B

	applications. In order for a GPS receiver to perform RAIM or fault detection (FD) function, a minimum of five visible satellites with satisfactory geometry must be visible to it	mandates require more – see FAA AC 20-165 or EASA CS-ACNS)
Training requirements ADS-B implementation	- Technical training - Operative training - Inspector training - Aircraft certification training - Other according with the different stakeholders and project scope. - Training basic on operational procedures - Others	ICAO Doc. 8071 Manual on Testing of Radio Navigation Aids. - Volume I - Testing of Ground-based Radio Navigation Systems - Volume II - Testing of Satellite-based Radio Navigation Systems - Volume III - Testing of Surveillance Radar Systems
Legislation/regulation	- CNS implementation Strategy - Rules - Technical information (data) - Operational procedures - Aircraft requirements	