International Civil Aviation Organization

SIP/2012/ASBU/Dakar-WP/28 A

Aviation System Block Upgrades

Module N° B0-05/ PIA 4

Improved Flexibility and Efficiency in Descent Profiles (CDOs)

Workshop on preparations for ANConf/12 − ASBU methodology
(Dakar, 4-6 July 2012)

Module N° B0-05

Improved Flexibility and Efficiency in Descent Profiles (CDOs)

Summary	Deployment of performance-based airspace and arrival procedures that allow aircrafts to fly their optimum profile taking account airspace and traffic complexity with continuous descent operations (CDOs).
Main Performance Impact	KPA-03 – Cost-effectiveness; KPA-04 – Efficiency; KPA-09 - Predictability
Operating Environment/Phases of Flight	Approach/Arrivals and En-Route.
Global Concept Component(s)	AOM – Airspace Organisation and Management AO – Aerodrome Operations TS – Traffic Synchronisation, AOM
Global Plan Initiatives (GPI)	GPI-10- Terminal Area Design and Management; GPI-11- RNP and RNAV Standard instrument Departures (SIDS)and Standard Terminal Arrivals (STARS);
Pre-Requisites	NIL
Global Readiness Checklist	Status
	Standards Readiness — Ready
	Avionics Availability — Ready
	Ground System Availability — Ready
	Procedures Available — Ready
	Operations Approvals — Ready

Module N° B0-05 - Baseline

- Varies from one State/region to the next.

- Some aspects of the movement to PBN have already been subject of local improvements in areas

Module N° B0-05 – Change brought by the Module

- **Element 1 ✈ Continuous Descent Operations (CDO)**
  - CDO is enabled by airspace design, procedure design and facilitation by ATC
  - An optimum CDO starts from the top-of-descent (TOD) and uses descent profiles that reduce controller-pilot communications and segments of level flight.
- **Element 2 ✈ Performance -based Navigation (PBN)**
  - The PBN concept encompasses two types of navigation specifications RNAV/RNP:
  - PBN STARs

Module N° B0-05 – Intended Performance Operational Improvement

Efficiency	❑reduced fuel burn ❑authorization of operations where noise limitations would otherwise result in operations being curtailed or restricted ❑reduction in the number of required radio transmissions ❑optimal management of the top-of-descent in the en-route airspace
Environment	✓Reduction on CO_2 through reduced fuel burn
Safety	▪ more consistent flight paths and stabilized approach paths ▪ reduction in the incidence of controlled flight into terrain (CFIT) ▪ reduction in the number of conflicts.
CBA	✓If implemented within the ICAO CDO manual framework, it is envisaged that the benefit/cost ratio (BCR) will be positive.

Module N° B0-05 – Necessary Procedures (Air & Ground)

- ICAO Continuous Descent Operations (CDO) Manual (Document 9931)
  - Provides guidance on the airspace design, instrument flight procedures, ATC facilitation and flight techniques necessary to enable continuous descent profiles.
- ICAO Performance-based Navigation Manual (ICAO Document 9613)
  - Provides general guidance on PBN implementation.
- ICAO PBN operational approval guidance material will be available by June 2012

Module N° B0-05 – Necessary System Capability

- **Avionics**
  - CDO does not require specific air/ground technology.
  - CDO is an aircraft operating technique aided by appropriate airspace and procedure design, and appropriate ATC clearances
- **Ground Systems**
  - RNP AR Approaches requires significant investment, ANSPs should work closely with airlines

Module N° B0-05 – Training and Qualification Requirements

- Training in the operational standards and procedures are required for this module
- Likewise, the qualifications requirements are identified in the regulatory requirements

Module N° B0-05 – Regulatory/standardization needs and Approval Plan (Air and Ground)

- **Regulatory/Standardization:** Use current published requirements
- **Approval Plans:** Must be in accordance with application requirements e.g. airspace design, air traffic operations, PBN requirements for fixed radius transitions, radius-to-fix legs, Required Time of Arrival (RTA), parallel offset, etc

Module N° B0-05 – Reference Documents

- Standards
  - For flight plan requirements in Amendment 1, ICAO Document 4444; PANS/ATM v15
- Procedures
- Guidance Material
  - ICAO Doc 9613, Performance-based Navigation (PBN) Manual; ICAO Doc 9931, Continuous Descent Operations (CDO) Manual;.
  - FAA Advisory Circular, AC 90-105, Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. National Airspace System) which provides system and operational approval guidance for operators (only reflects the US situation).
- Approval Documents
  - ICAO Doc 9931, Continuous Descent Operations Manual;
  - ICAO Doc 9613, Performance Based Navigation Manual;
  - FAA AC120-108, CDFA.

Module N° B0-05 Implementation - Benefits and Elements

Improved Flexibility and Efficiency in Descent Profiles (CDOs)

Benefits - Main Key Performance Areas (KPA)					
KPAs	**Access**	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	**N**	**N**	**Y**	**Y**	**Y**

Elements: CDO and PBN STARs

No avionics or Ground systems are required

To be reflected in ANRF


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