International Civil Aviation Organization

SIP/2012/ASBU/Dakar-WP/16E

Aviation System Block Upgrades

Module N° B0-15/PIA 1

Improve Traffic Flow Through Runway Sequencing (AMAN/DMAN)

Workshop on preparations for ANConf/12 − ASBU methodology
(Dakar, 16-20 July 2012)

Module N° B0-15

Improve Traffic Flow Through Runway Sequencing (AMAN/DMAN)

Summary	To manage arrivals and departures to and from a multi-runway aerodrome or locations with multiple dependent runways at closely proximate aerodromes to efficiently utilize the inherent runway capacity	
Main Performance Impact	-KPA-02 Capacity	- KPA-04 Efficiency
	-KPA-09 Predictability	- KPA-06 Flexibility
Applicability Considerations	Runways and Terminal Manoeuvring Area in major hubs and metropolitan areas will be most in need of these improvements. Runway Sequencing procedures are widely used in aerodromes globally. However, some locations might have to confront environmental and operational challenges	
Global Concept Element(s)	TS – Traffic Synchronization	
Global Plan Initiative	GPI-6 Air Traffic Flow Management	
Global Readiness Checklist		Status
	Standards Readiness	Ready
	Avionics Availability	Ready
	Ground System Availability	Ready
	Procedures Available	Ready
	Operations Approvals	Ready

Module N° B0-15 - Baseline

- Manual process by which the air traffic controller uses local procedures and his expertise to sequence departures or arrivals in real time.

Module N° B0-15 – Change Brought by the Module

- **Element 1 ✈ AMAN**
  - Arrival management (AMAN)sequences the aircraft, based on the airspace state, wake turbulence, aircraft capability, and user preference. The smoothed sequence allows increase aerodrome throughput. Arriving flights are “metered” by Control Time of Arrival (CTAs) and must arrive at a defined point close to the aerodrome by this time.
- **Element 2 ✈ DMAN**
  - Departure management serves to optimize departure operations to ensure the most efficient utilization of aerodrome resources.
  - Slots assignment and adjustments will be supported by departure management automations. Departure management sequences the aircraft, based on the airspace state, wake turbulence, aircraft capability, and user preference, to fit into the overhead

Module N° B0-15 – – Intended Performance Operational Improvement

Capacity	-Optimizes usage of terminal airspace and runway capacity -Optimize utilization of terminal and runway resources
Efficiency	Harmonized arriving traffic flow from en-route to terminal and aerodrome through sequencing arrival flights; lincreased runway throughput and arrival rates. Streamline departure traffic flow and decreased lead time for departure request. Automated dissemination of departure information and clearances.
Predictability	Decrease uncertainties in aerodrome/terminal demand prediction
Flexibility	Enables dynamic scheduling.
CBA	-Business case built for Time Based Flow Management in US. - Case proves that benefit/cost ratio is positive

Module N° B0-15 – Necessary Procedures (Air & Ground)

- The US TBFM and EUROCONTROL AMAN/DMAN efforts provide the systems and operational procedures necessary.
- In particular, procedures for the extension of metering into en-route airspace will be necessary.
- PBN for arrival will also be crucial as well.

Module N° B0-15 – Necessary System Capability

- **Avionics**
  - No avionics capability is required
- **Ground Systems**
  - Automation support is needed for the synchronization of arrival sequencing, departure sequencing, and surface information;
  - For AMAN/DMAN application, existing technologies can be leveraged, but require site adaptation and maintenance.

Module N° B0-15 – Training and Qualification Requirements

- Automation support is needed for Air Traffic Management in airspace with high demands. Thus, training is needed for ATM personnel.
- Training in the operational standards and procedures are required
- Likewise, the qualifications requirements are identified in the regulatory requirements in Section 6 which form an integral part to the implementation of this module..

Module N° B0-15 – Regulatory/Standardization Needs and Approval Plan (Air & Ground)

- Regulatory/Standardization: Updates required to current published criteria
- Approval Plans: To Be Determined.

Module N° B0-15 – Reference Documents

- ***Standards - NIL***
- ***Procedures -NIL***
- ***Guidance Materials***
  - European ATM Master Plan, Edition 1.0, March 2009, update in progress;
  - SESAR Definition Phase Deliverable 2 – The Performance Target, December 2006;
  - SESAR Definition Phase Deliverable 3 – The ATM Target Concept, September 2007;
  - SESAR Definition Phase Deliverable 5 – SESAR Master Plan, April 2008;
  - TBFM Business Case Analysis Report;
  - NextGen Midterm Concept of Operations v.2.0;
  - RTCA Trajectory Operations Concept of Use.
- ***Approval Documents***

Module N° B0-15 Implementation - Benefits and Elements

Improve Traffic Flow Through Runway Sequencing (AMAN/DMAN)

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

Elements:

1. AMAN
2. DMAN

To be reflected in ANRF

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