



**FAA**  
Air Traffic Organization



# ASBU B0 ANRF Exercise

For: ASBU WS @NACC  
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Date: August, 2016

# ASBU must be...

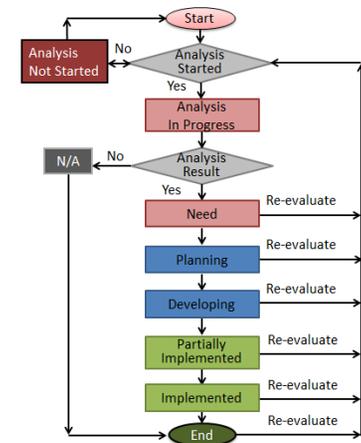
- **Simple**
- **Understandable**
- **Meaningful**



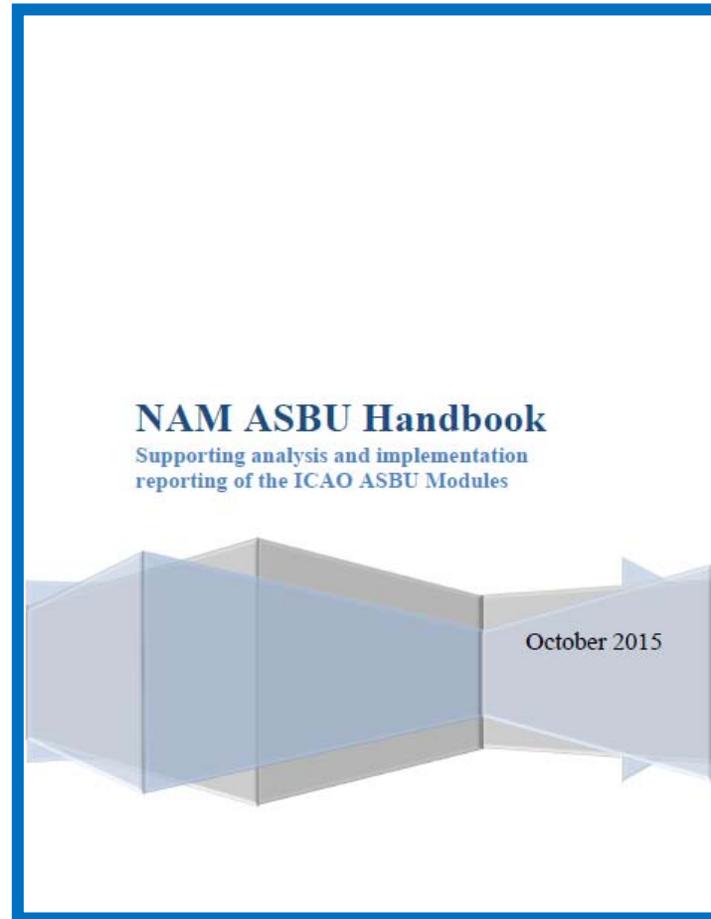
# You should have

1. One Fully Completed ANRF Sample (FAA ASBU ANRF B0 CDO)
2. Summary Table for Implementation Status (a.k.a. pretty table, colorful table)
3. Analysis and Implementation Workflow Diagram
4. ANRF Explanation and Instruction
5. 18 B0 ANRFs

Module	Elements	Need Analysis				Implementation Status (of Element is needed)	
		Not Started	In Progress	Not	N/A	Planning	Developing/Implementing/Implemented
<b>Performance Improvement Area 1: Airport Operations</b>							
ACDM	1. Airport CDM procedures						N
	2. Airport CDM tools						N
APFA	1. Collaborative departure queue management						N
	2. PBN Approach Procedures with vertical guidance (LPV, LNAV/VNAV minima, using SBAS and Baro VNAV)						N
	3. PBN Approach Procedures without vertical guidance (LP, LNAV minima, using SBAS)						N
RSEQ	1. GBAS Landing System (GLS) Approach procedures						N
	2. AMAN via controlled time of arrival to a reference fix						N
	3. AMAN via controlled time of arrival at the aerodrome						N
	4. Departure management						N
	5. Departure flow management						N
SURF	1. Point merge						N
	2. A-SMGCS with at least one cooperative surface surveillance system						N
	3. Including ADS-B APF as an element of A-SMGCS						N
	4. A-SMGCS alerting with flight identification information						N
	5. Airport vehicles equipped with transponders						N
WAKE	1. New PANS-ATM wake turbulence categories and separation minima						N
	2. Dependent diagonal parallel approach procedure for parallel runways with centerlines spaced less than 70 meters (230 feet) apart						N
	3. Wake independent departure and arrival procedures for parallel runways with centerlines spaced less than 70 meters (230 feet) apart						N
	4. Wake turbulence mitigation for departure procedures for parallel runways with centerlines spaced less than 70 meters (230 feet) apart						N
	5. Wake turbulence mitigation for departure procedures for parallel runways with centerlines spaced less than 70 meters (230 feet) apart						N



# Also use Handbook



# You will learn

- ANRF structure
- How to fill in ANRF
- How use ANRF to set your target
- How use ANRF to fill in pretty table
- How to put together your ANP



# ANRF

[STATE] ASBU Air Navigation Reporting Form (ANRF)			
PIA	4	Block - Module	B0 - CDO
Date	Month Day, 2016		
<b>Module Description:</b> Performance-based airspace and arrival procedures allowing aircraft to fly their optimum profile using continuous descent operations (CDOs). This will optimize throughput, allow fuel efficient descent profiles, and increase capacity in terminal areas.			
<b>Element Implementation Status</b>			
1	<b>Element Description:</b> (Derived from Element 1) Procedure changes to facilitate CDO Status Detail:	Date Planned/Implemented	Status
2	<b>Element Description:</b> (Derived from Element 1) Route changes to facilitate CDO Status Detail:	Date Planned/Implemented	Status
3	<b>Element Description:</b> (Derived from Element 2) PEN STARs Status Detail:	Date Planned/Implemented	Status
<b>Achieved Benefits</b>			
<i>Access and Equity</i>			
<i>Capacity</i>			
<i>Efficiency</i>			
<i>Environment</i>			
<i>Safety</i>			
<b>Implementation Challenges</b>			
<i>Ground system Implementation</i>			
<i>Avionics Implementation</i>			
<i>Procedures Availability</i>			
<i>Operational Approvals</i>			
<b>Notes</b>			



# ANRF – B0 APTA

[STATE] ASBU Air Navigation Reporting Form (ANRF)					
PIA	1	Block - Module	B0 - APTA	Date	Month Day, 2016
<p><b>Module Description:</b> The use of Performance-based Navigation (PBN) and ground-based augmentation system (GBAS) landing system (GLS) procedures to enhance the reliability and predictability of approaches to runways, thus increasing safety, accessibility and efficiency. This is possible through the application of basic global navigation satellite system (GNSS), Baro-vertical navigation (VNAV), satellite-based augmentation system (SBAS) and GLS. The flexibility inherent in PBN approach design can be exploited to increase runway capacity.</p>					
<b>Element Implementation Status</b>					
1	<b>Element Description:</b> PBN Approach Procedures with vertical guidance (LPV, LNAV/VNAV minima, using SBAS and Baro VNAV)			Date Planned/Implemented	Status
	Status Details				
2	<b>Element Description:</b> PBN Approach Procedures without vertical guidance (LP, LNAV minima; using SBAS)			Date Planned/Implemented	Status
	Status Details				
3	<b>Element Description:</b> GBAS Landing System (GLS) Approach procedures			Date Planned/Implemented	Status
	Status Details				

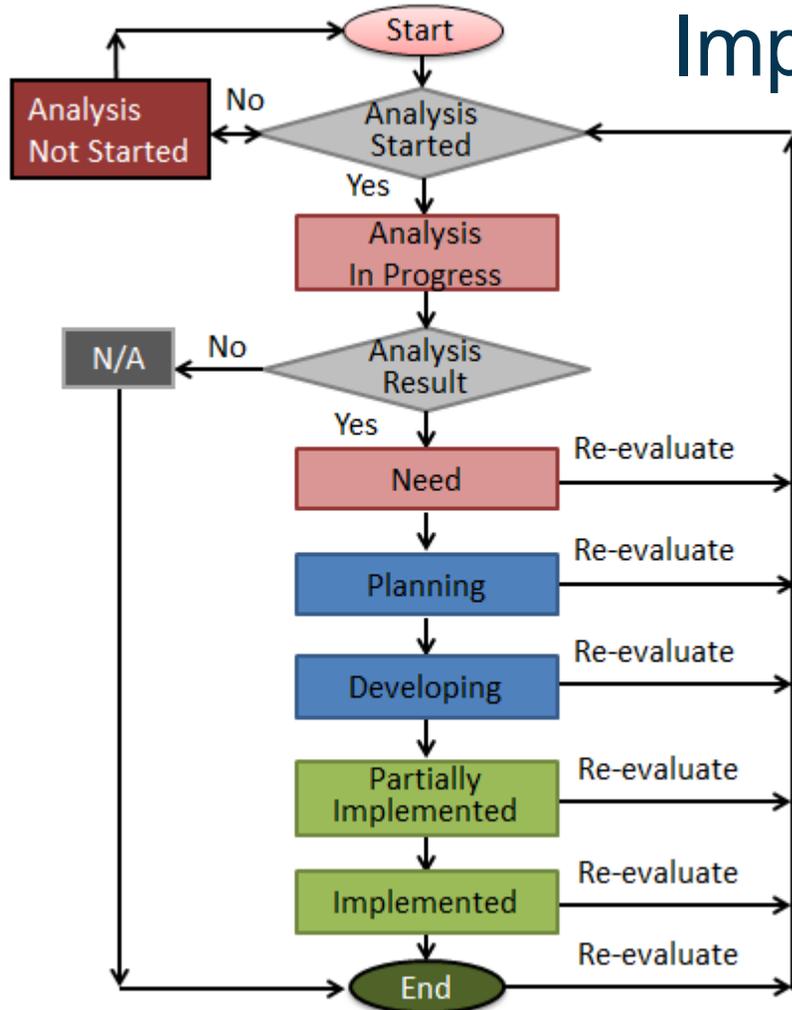


# ANRF

<b>Achieved Benefits</b>
<i>Access and Equity</i>
<i>Capacity</i>
<i>Efficiency</i>
<i>Environment</i>
<i>Safety</i>
<b>Implementation Challenges</b>
<i>Ground system Implementation</i>
<i>Avionics Implementation</i>
<i>Procedures Availability</i>
<i>Operational Approvals</i>
<b>Notes</b>



# ASBU Element Analysis and Implementation Process



1. Analysis Not Started
2. Analysis In Progress
3. Need
4. Planning
5. Developing
6. Partially Implemented
7. Implemented
8. N/A



# Fill in ANRF

- B0 APTA
- B0 NOPS
- B0 DATM
- B0 CDO
- B0 AMET



# B0 NOPS

4

[STATE] ASBU Air Navigation Reporting Form (ANRF)			
<b>PIA</b>	3	<b>Block - Module</b>	B0 - NOPS
<b>Date</b>	Month Day, 2016		
<p><b>Module Description:</b> Air traffic flow management (ATFM) is used to manage the flow of traffic in a way that minimizes delays and maximizes the use of the entire airspace. ATFM can regulate traffic flows involving departure slots, smooth flows and manage rates of entry into airspace along traffic axes, manage arrival time at waypoints or flight information region (FIR)/sector boundaries and re-route traffic to avoid saturated areas. ATFM may also be used to address system disruptions including a crisis caused by human or natural phenomena.</p>			
<b>Element Implementation Status</b>			
<b>1</b>	<b>Element Description:</b>	<b>Date Planned/Implemented</b>	<b>Status</b>
	ATFM		
	<b>Status Details</b>		



# B0 DATM

[STATE] ASBU Air Navigation Reporting Form (ANRF)			
PIA	2	Block - Module	B0 - DATM
Date	Month Day, 2016		
<b>Module Description:</b> The initial introduction of digital processing and management of information through, aeronautical information service (AIS)/aeronautical information management (AIM) implementation, use of aeronautical exchange model (AIXM), migration to electronic aeronautical information publication (AIP) and better quality and availability of data.			
<b>Element Implementation Status</b>			
1	<b>Element Description:</b> Aeronautical Information Exchange Model (AIXM)	Date Planned/Implemented	Status
Status Details			
2	<b>Element Description:</b> <u>eAIP</u>	Date Planned/Implemented	Status
Status Details			
3	<b>Element Description:</b> <u>Digital</u> NOTAM	Date Planned/Implemented	Status
Status Details			
4	<b>Element Description:</b> <u>eTOD</u>	Date Planned/Implemented	Status
Status Details			
5	<b>Element Description:</b> (Identified by NACC) WGS-84	Date Planned/Implemented	Status
Status Details			
6	<b>Element Description:</b> QMS for AIM	Date Planned/Implemented	Status
Status Details			



# B0 CDO

[STATE] ASBU Air Navigation Reporting Form (ANRF)			
<b>PIA</b>	4	<b>Block - Module</b>	B0 - CDO
		<b>Date</b>	Month Day, 2016
<b>Module Description:</b> Performance-based airspace and arrival procedures allowing aircraft to fly their optimum profile using continuous descent operations (CDOs). This will optimize throughput, allow fuel efficient descent profiles, and increase capacity in terminal areas.			
<b>Element Implementation Status</b>			
1	<b>Element Description:</b> Procedure changes to facilitate CDO	<b>Date Planned/Implemented</b>	<b>Status</b>
	<b>Status Details</b>		
2	<b>Element Description:</b> Route changes to facilitate CDO	<b>Date Planned/Implemented</b>	<b>Status</b>
	<b>Status Details</b>		
3	<b>Element Description:</b> PBN STARs	<b>Date Planned/Implemented</b>	<b>Status</b>
	<b>Status Details</b>		



# BO AMET

Element Implementation Status			
1	Element Description: WAFS	Date Planned/Implemented	Status
	Status Details		
2	Element Description: IAVW	Date Planned/Implemented	Status
	Status Details		
3	Element Description: TCAC forecasts	Date Planned/Implemented	Status
	Status Details		
4	Element Description: Aerodrome warnings	Date Planned/Implemented	Status
	Status Details		
5	Element Description: Wind shear warnings and alerts	Date Planned/Implemented	Status
	Status Details		
6	Element Description: SIGMET	Date Planned/Implemented	Status
	Status Details		
7	Element Description: Other OPMET information (METAR, SPECI and/or TAF)	Date Planned/Implemented	Status
	Status Details		
8	Element Description: QMS for MET	Date Planned/Implemented	Status
	Status Details		



# Metrics and Target

- Defining the Metrics and Targets

This subject will be discussed in the National ANP section of the workshop.



# Setting the Targets

Block 0 Modules	Elements	Questions	Targets	Progress & Remarks
<b>Performance Improvement Area 1: Airport Operations</b>				
ACDM	1. Airport CDM procedures	Number of aerodromes to be considered: 2 a. Have we assessed the need? <i>Yes or No</i> b. How many aerodromes need this capability? <i>None, 1, or 2</i> c. How many aerodromes implemented the capability? <i>None, 1, or 2</i>	<b>B0-ACDM1 Target 1:</b> Assess by Dec 2016 a. No	<b>This sample Target</b> assumes not all assessment has done.  Remark may say 1 assessed and 1 not assessed.
	2. Airport CDM tools	Number of aerodromes to be considered: 2 a. Have we assessed the need? <i>Yes or No</i> b. How many aerodromes need this capability? <i>None, 1, or 2</i> c. How many aerodromes implemented the capability? <i>None, 1, or 2</i>	<b>B0-ACDM-2 Target 1:</b> Assessed in Aug 2016 a. Yes b. None	<b>This sample Target</b> assumes assessment has done and <b>no</b> need for this capability.  <b>Remark is:</b> Status: N/A
	3. Collaborative departure queue management	Number of aerodromes to be considered: 2 a. Have we assessed the need? <i>Yes or No</i> b. How many aerodromes need this capability? <i>None, 1, or 2</i> c. How many aerodromes implemented the capability? <i>None, 1, or 2</i>	<b>B0-ACDM3 Target 1:</b> Assessed in Aug 2016 a. Yes b. 1 <b>B0-ACDM3 Target 2:</b> Implement by Dec 2016 c. None	<b>This sample Target</b> assumes assessment has done and only 1 need for this capability. Not implemented.  <b>Remark could be:</b> Status: Planning Encountered XXX difficulty. Department AAA is working on it.



# Setting the Targets – cont.

APTA	1. PBN Approach Procedures with vertical guidance (LPV, LNAV/VNAV minima, using SBAS and Baro VNAV)	Number of aerodromes to be considered: 2 a. Have we assessed the need? <i>Yes or No</i> b. How many aerodromes need this capability? <i>None, 1, or 2</i> c. How many aerodromes implemented the capability? <i>None, 1, or 2</i>	<b>B0-APTA-1 Target 1:</b> Assessed in August 2016 a. Yes b. 2 <b>B0-APTA-1 Target 2:</b> Implement by Dec 2016 c. 1	<b>This sample Target</b> assumes assessment has done, and 2 need, 1 completed the implementation, but other is still not implemented. <b>Remark could be:</b> Status: Partially Implemented
	2. PBN Approach Procedures without vertical guidance (LP, LNAV minima; using SBAS)	Number of aerodromes to be considered: 2 a. Have we assessed the need? <i>Yes or No</i> b. How many aerodromes need this capability? <i>None, 1, or 2</i> c. How many aerodromes implemented the capability? <i>None, 1, or 2</i>	<b>B0-APTA-2 Target 1:</b> Assessed in August 2016 a. Yes b. 2 <b>B0-APTA-2 Target 2:</b> Implement by Dec 2016 c. 2	<b>This sample Target</b> assumes assessment has done, and 2 need, and all completed the implementation.
	3. GBAS Landing System (GLS) Approach procedures	Number of aerodromes to be considered: 2 a. Have we assessed the need? <i>Yes or No</i> b. How many aerodromes need this capability? <i>None, 1, or 2</i> c. How many aerodromes implemented the capability? <i>None, 1, or 2</i>	<b>B0-APTA-3. Target 1:</b> Assess by Dec 2016 a. No	



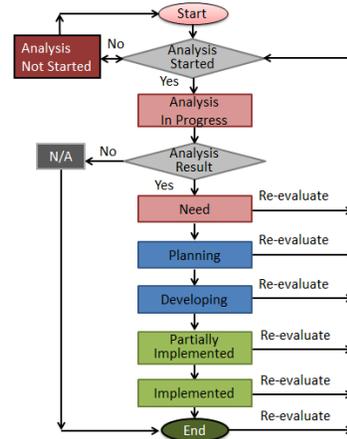
# Filling in Summary Status Table

Module	Elements	Need Analysis				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
<b>Performance Improvement Area 1: Airport Operations</b>									
ACDM	1. Airport CDM procedures								
	2. Airport CDM tools								
	3. Collaborative departure queue management								
APTA	1. PBN Approach Procedures with vertical guidance (LPV, LNAV/VNAV minima, using SBAS and Baro VNAV)								
	2. PBN Approach Procedures without vertical guidance (LP, LNAV minima; using SBAS)								
	3. GBAS Landing System (GLS) Approach procedures								
RSEQ	1. AMAN via controlled time of arrival to a reference fix								
	2. AMAN via controlled time of arrival at the aerodrome								
	3. Departure management								
	4. Departure flow management								
	5. Point merge								
SURF	1. A-SMGCS with at least one cooperative surface surveillance system								
	2. Including ADS-B APT as an element of A-SMGCS								
	3. A-SMGCS alerting with flight identification information								
	4. Airport vehicles equipped with transponders								
WAKE	1. New PANS-ATM wake turbulence categories and separation minima								
	2. Dependent diagonal paired approach procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart								
	3. Wake independent departure and arrival procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart								



# State ANP – ASBU Section

- Approach for ASBU implementation
- Reporting and Monitoring Results
- Target Table
- Status Summary Table
- Append ANRFs



Element ID	Element Name	Element Description	Element Status	Element Priority	Element Owner	Element Start Date	Element End Date
1	ASBU Element 1	ASBU Element 1 Description	ASBU Element 1 Status	ASBU Element 1 Priority	ASBU Element 1 Owner	ASBU Element 1 Start Date	ASBU Element 1 End Date
2	ASBU Element 2	ASBU Element 2 Description	ASBU Element 2 Status	ASBU Element 2 Priority	ASBU Element 2 Owner	ASBU Element 2 Start Date	ASBU Element 2 End Date

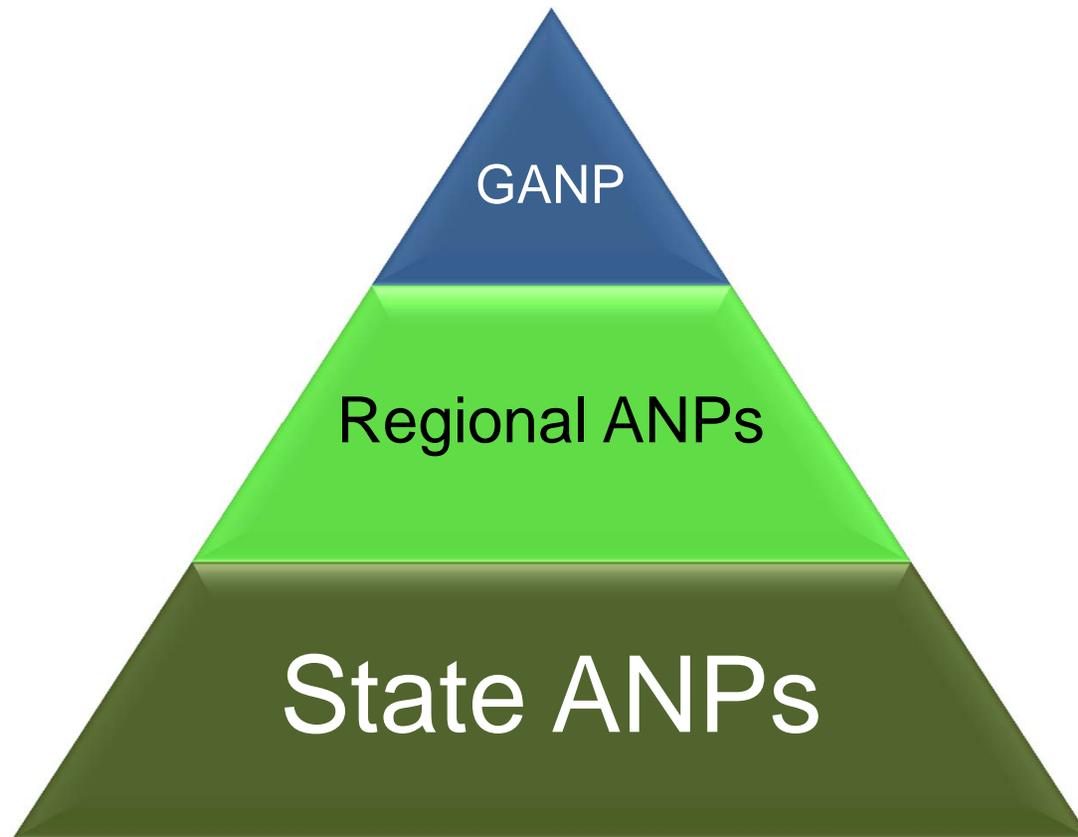
Module	Elements	Need Analysis				Implementation Status (if Element is needed)	
		Not Started	In Progress	Need	N/A	Developing	Implemented
<b>Performance Improvement Area 1: Airport Operations</b>							
ACDM	1. Airport CDM procedures						
	2. Airport CDM tools						
	3. Collaborative departure queue management						
APFA	1. PBN Approach Procedures with vertical guidance (LPV, LNAV/VNAV minima, using SBAS and RNP VNAV)						
	2. PBN Approach Procedures without vertical guidance (LP, LNAV minima, using SBAS)						
	3. GBAS Landing System (GLS) Approach procedures						
KSEQ	1. A-SNM via controlled time of arrival to a reference fix						
	2. A-SNM via controlled time of arrival at the aerodrome						
	3. Departure management						
	4. Departure flow management						
	5. Point merge						
SURF	1. A-SMOCs with at least one cooperative surface surveillance system						
	2. Including ADS-B APF as an element of A-SMOCs						
	3. A-SMOCs alerting with flight identification information						
	4. Airport vehicles equipped with transponders						
WAKE	1. New PANS-ATM wake turbulence categories and separation minima						
	2. Dependent diagonal paired approach procedures for parallel runways with centerlines spaced less than 760 meters (2,500 feet) apart						
	3. Wake independent departure and arrival procedures for parallel runways with centerlines spaced less than 760 meters (2,500 feet) apart						
	4. Wake turbulence mitigation for departure procedures for parallel runways with centerlines spaced less than 760 meters (2,500 feet) apart						
	5. Wake turbulence categories and separation minima						

Block #	Element	Question	Target	Progress & Remarks
ACDM	1. Airport CDM procedures	1. Number of arrivals to be considered?	By ACDB 1 Target 1: January 2018	Completed
		2. How is it controlled/managed?	By ACDB 1 Target 1: January 2018	Completed
		3. How many arrivals are implemented/eligible?	By ACDB 1 Target 1: January 2018	Completed

Block #	Element	Question	Target	Progress & Remarks
ACDM	1. Airport CDM procedures	4. How many arrivals are implemented/eligible?	By ACDB 1 Target 1: January 2018	Completed
		5. How many arrivals are implemented/eligible?	By ACDB 1 Target 1: January 2018	Completed
		6. How many arrivals are implemented/eligible?	By ACDB 1 Target 1: January 2018	Completed
		7. How many arrivals are implemented/eligible?	By ACDB 1 Target 1: January 2018	Completed
		8. How many arrivals are implemented/eligible?	By ACDB 1 Target 1: January 2018	Completed



# We are together to





# Questions?

# Thank you!

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