



MIDANPIRG PBN SG/4 Meeting Cairo, Egypt, 19-21 January 2020



PBN implementation plan 2020

By: Egypt

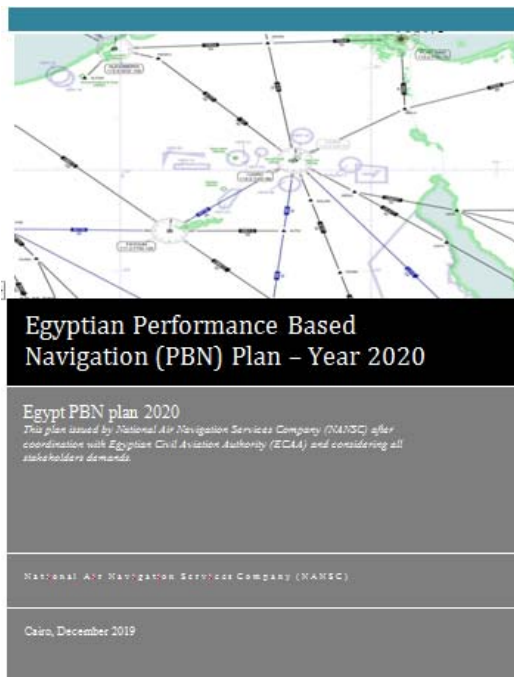
Presentation Outline

- Brief of the State National PBN Implementation Plan
- Status of Implementation
- Post assessment results of the PBN Implementation
- Lessons Learned
- Challenges
- Thoughts/Recommendations

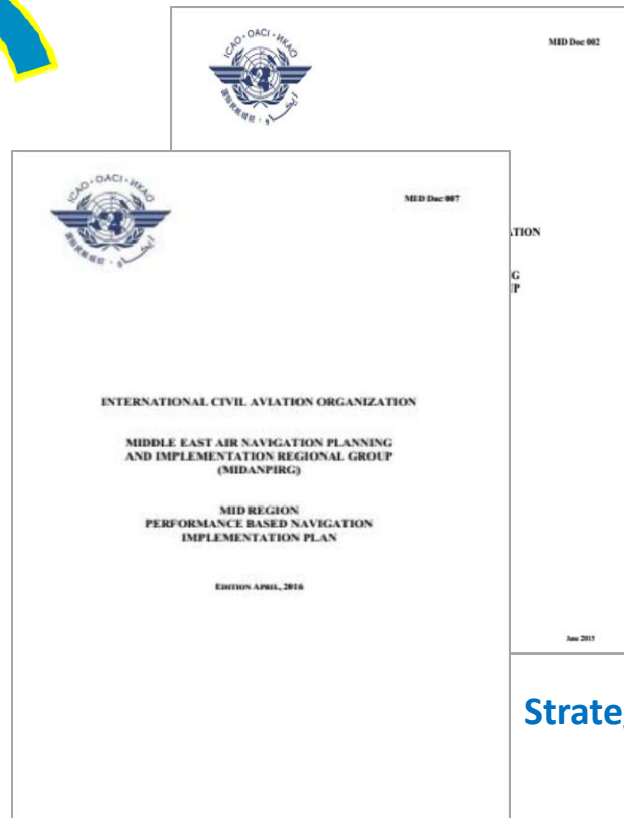
Egypt PBN Implementation Plan



CAPACITY & EFFICIENCY



National PBN PLAN



MID PBN Implementation PLAN

Strategy



ICAO - GANP

Egypt PBN Implementation Plan

Edition	Date	Status	Author	Justification
Version 1.1	Sept. 2012	Issued by NANSO	PBN Implementation Plan Working Group	First version
Version 1.2	Dec. 2013	Issued by NANSO	PBN Implementation Plan Working Group	Plan not updated Explanatory text revised based on comments from Stakeholders
Version 1.3	Mar. 2014	Issued by NANSO	PBN Implementation Plan Working Group	Plan updated per Mar. 2014 Explanatory text revised accordingly
Version 1.4	Jan. 2015	Issued by NANSO	PBN Working Group	
Version 1.5	August 2016	Issued by NANSO	PBN Committee	New version
Version 1.6	August 2017	Issued by NANSO	PBN Committee	
Version 1.7	Sept. 2018	Issued by NANSO	PBN Committee	
Year 2020	Dec. 2019	Issued by NANSO	PBN Committee	Versions are no longer numeric but named by year of target plan

National PBN Implementation Plan

- Egypt PBN Implementation plan year 2020.

Short Term	2013 – 2018 (done)
Medium Term	2019 – 2025
Long Term	2026 and beyond

- (7) Primary/major international aerodromes

Cairo	HECA
Borg El-Arab	HEBA
Sharm El-Shekh	HESH
HURGHADA	HEGN
LUXOR	HELX
ASWAN	HESN
Marsa Alam	HEMA

Implementation Target

Airspace	Short term 2015-2020		Medium term 2021-2025	
	Navigation Specification Preferred	Target	Navigation Specification Acceptable	Target
En-route Continental	RNAV5 RNAV1	100% by 2017	RNP 2* Defined airspace (A- RNP)	TBD
En-route Local/domestic	RNAV5 RNAV1	100% by 2017	RNP 2* Defined airspace (A- RNP)	TBD
TMA - Arrival	RNAV 1 in surveillance environment and with adequate navigation infrastructure. RNP 1 in non- surveillance environment	64% by 2019 100% by 2020	A-RNP	100% by 2025
TMA – Departure	RNAV 1 in surveillance environment and with adequate navigation infrastructure. RNP 1 in non- surveillance environment	68% by 2019 100% by 2020	A-RNP	100% by 2025
Approach	LNAV: for all RWY Ends at International Airports	96% by 2019 100% by 2020	GLS (GBAS) approach For the defined RWY Ends Based on operational needs and CBA	TBD
	LNAV/VNAV: for all RWY Ends at International Airports	55% by 2019 100% 2020		
CCO and CDO	W/A	TBD	W/A	100% by 2025

Status of Implementation



- ✦ ECAA is the Regulatory Body
- ✦ Egyptian Regulation: ECAR 311, EAC 311_1, ECAR 172, ECA 172_5



- ✦ NANSC is the recognized entity for designing PBN Procedures
- ✦ (9) PANS OPS Designers
Automated tool: WVX based on AutoCAD platform.



Status of Implementation

RWY Ends	ILS / CAT	LNAV	LNAV/ VNAV	LPV	RNP AR	RNAV SID	RNAV STAR
HECA05L	I	Y	X			X	X
HECA05C	II	Y	X			X	X
HECA05R	II	Y	X			X	X
HECA23L	II	Y	X			X	X
HECA23C	II	Y	X			X	X
HECA23R	I	Y	X			X	X

Status of Implementation

RWY Ends	ILS / CAT	LNAV	LNAV/ VNAV	LPV	RNP AR	RNAV SID	RNAV STAR
HEGN16L	X	Y	Y			Y	Y
HEGN16R	X	Y	Y			Y	Y
HEGN34L	X	Y	Y			Y	Y
HEGN34R	I	Y	Y			Y	Y
HESH04L	I	Y	Y			Y	Y
HESH04R	X	Y	Y			Y	Y

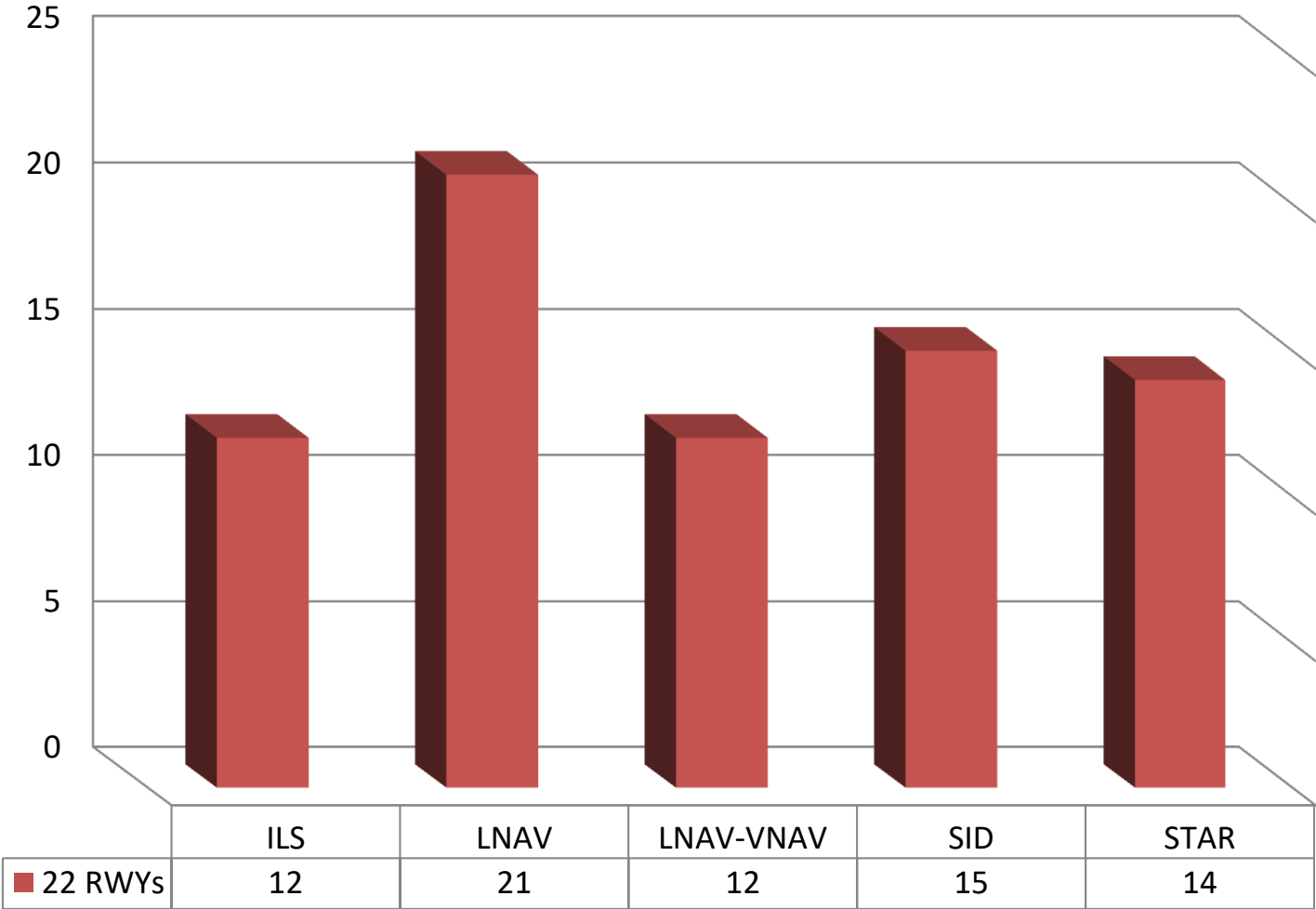
Status of Implementation

RWY Ends	ILS / CAT	LNAV	LNAV/ VNAV	LPV	RNP AR	RNAV SID	RNAV STAR
HESH22L	X	Y	Y			Y	Y
HESH22R	X	Y	Y			Y	Y
HELX02	I	Y	Y			Y	Y
HELX20	I	Y	Y			Y	Y
HESN17	X	Y	Y			Y	Y
HESN35	I	Y	Y			Y	Y

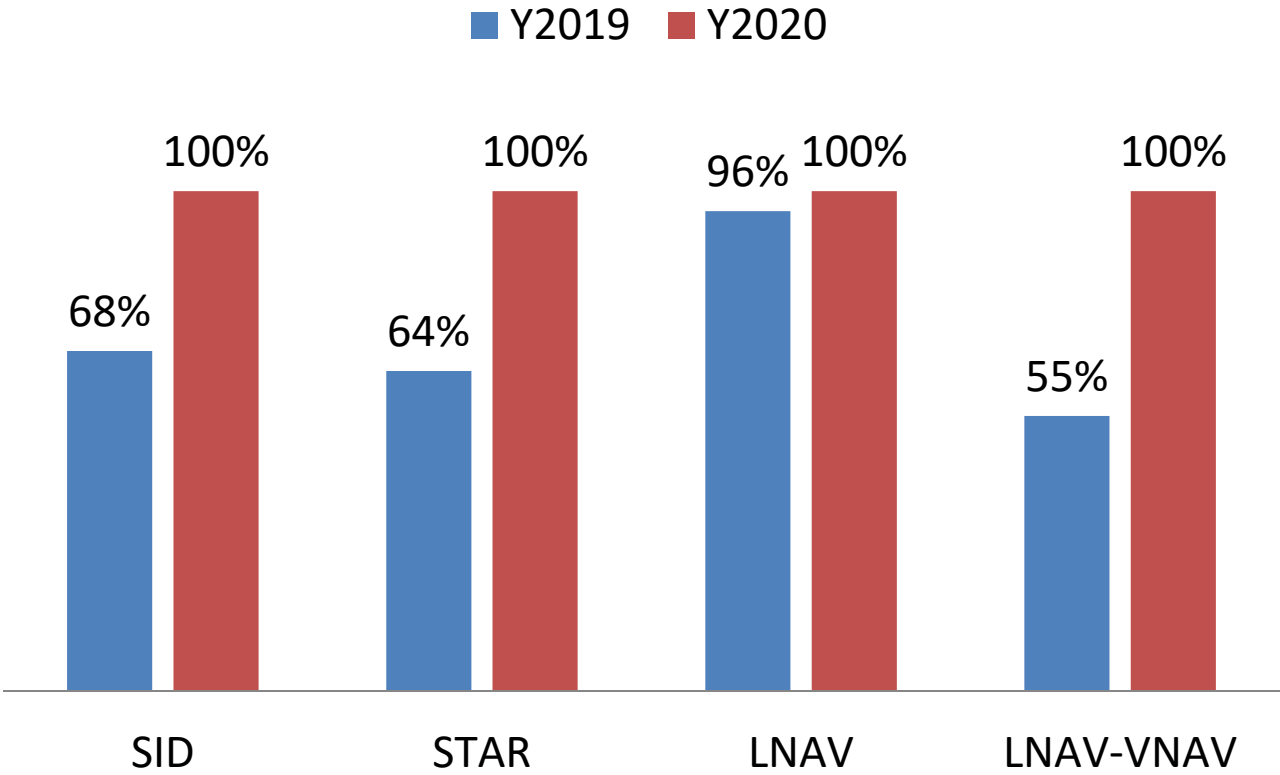
Status of Implementation

RWY Ends	ILS / CAT	LNAV	LNAV/ VNAV	LPV	RNP AR	RNAV SID	RNAV STAR
HEBA14	X	X	X			X	X
HEBA32	I	Y	X			Y	X
HEMA15	X	Y	X			Y	Y
HEMA33	X	Y	X			Y	Y

Status of Implementation



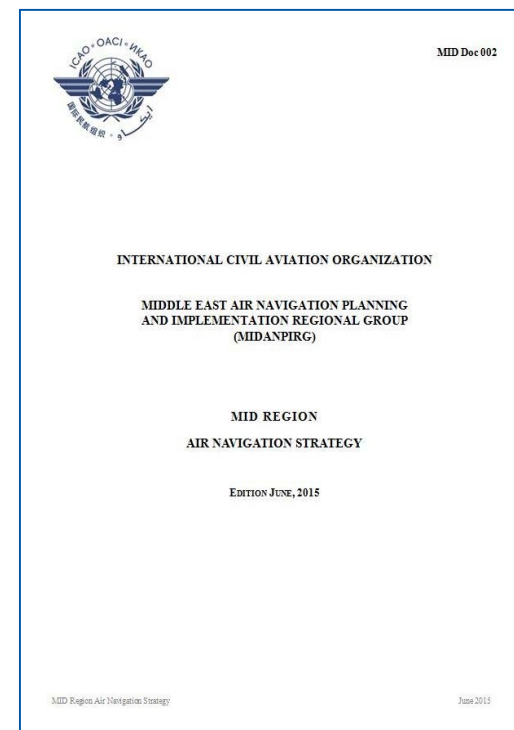
Status of Implementation



PBN Implementation & ASBU

Mid Region Deliverables:

- Air Navigation Strategy was endorsed by MSG/4 meeting (Cairo, 24-26 November 2014).
- further reviewed and updated by MIDANPIRG/15 meeting (Bahrain, 8-11 June 2015).
- The current version (MID Doc 002) was updated by MIDANPIRG/16 (Kuwait, 13-16 February 2017).



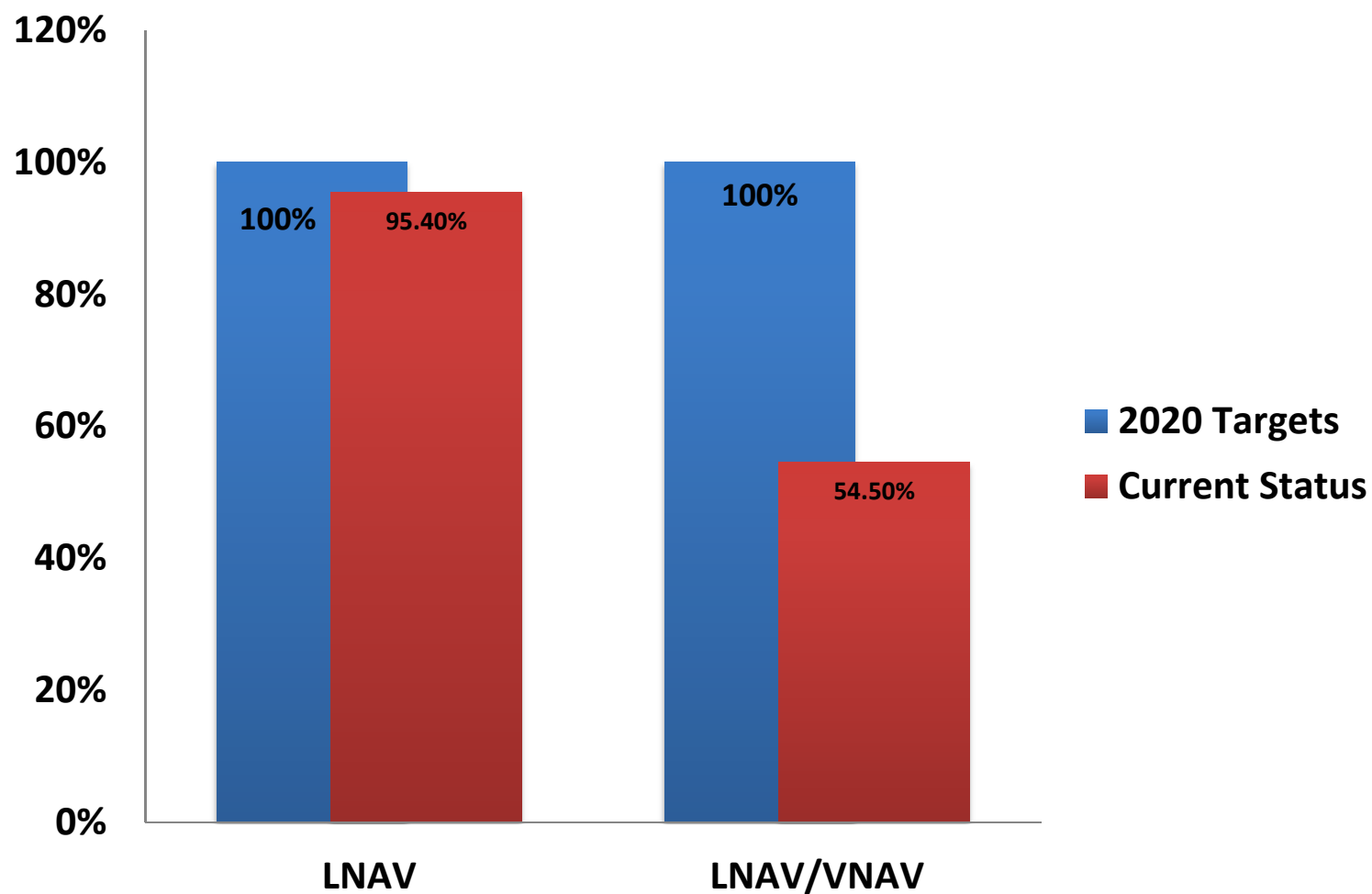
PBN Implementation & ASBU

- **PBN implementation plan evolution with ASBU Blocks:**
 - Near-term (2013 - 2018): ASBU Block 0
 - Mid-term (2019 - 2024): ASBU Block 1

Status of Egypt B0-APTA Implementation

B0, B1 – APTA: Optimization of Approach Procedures including vertical guidance				
Elements	Applicability	Status	Targets/Timeline	Remarks
State's PBN Implementation Plans	Egypt	Implemented		Updated Version submitted by December 2020
LNAV	All RWYs Ends at International Aerodromes HECA, HESN, HESH, HEMA, HEGN, HELX, HEBA (22 RWYs Ends)	95.4 % of RWY Ends (21 THR) with RNP APCH (LNAV only)	100% by 2020	GLS (GBAS) approach for the defined RWY ends based on operational needs and CBA. (ASBU B1)
LNAV/VNAV	All RWYs Ends at International Aerodromes HECA, HESN, HESH, HEMA, HEGN, HELX, HEBA (22 RWYs Ends)	54.5% of RWY Ends (12 THR) provided with Baro-VNAV APP procedure	100% by 2020	

Status of Egypt B0-APTA Implementation



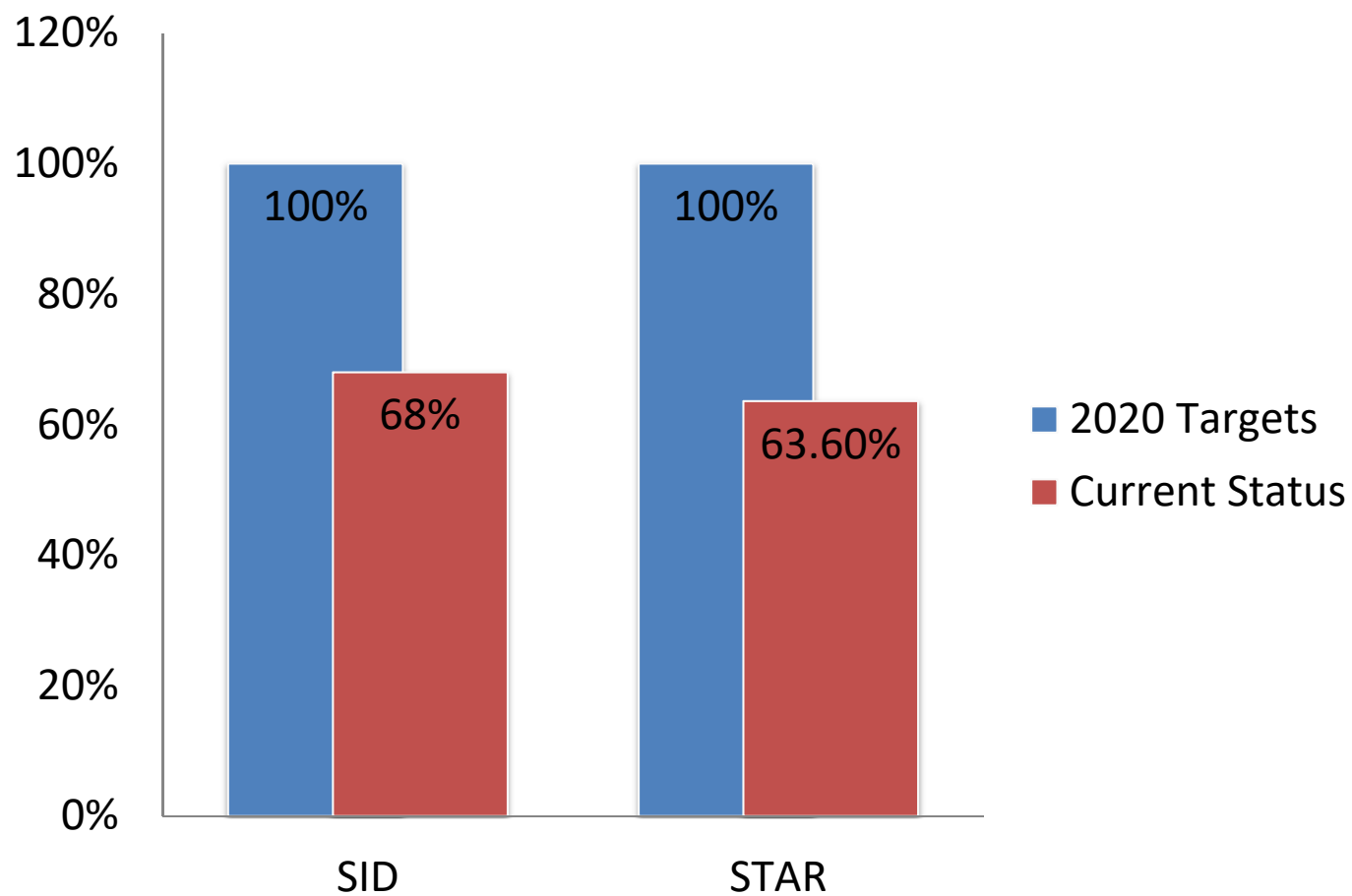
Status of Egypt B0-CDO Implementation

B0 – CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO)			
Elements	Status	Targets/ Timeline	Remarks
PBN STARs	64% of International Aerodromes/TMAs with PBN STAR	100% by 2020	
International aerodromes/ TMAs with CDO	Not Implemented	TBD	To be extended in ASBU B1 (Basic & Advanced)

Status of Egypt B0-CCO Implementation

B0 – CCO: Improved Flexibility and Efficiency Departure Profiles -Continuous Climb Operations (CCO)			
Elements	Status	Targets/ Timeline	Remarks
PBN SIDs	68% of International Aerodromes/TMAs with PBN SID	100% by 2020	
International aerodromes/ TMAs with CCO	Not Implemented	TBD	To be extended in ASBU B1

Status of Egypt SID/STAR Implementation



Egypt Preparation for ASBU B1

ASBU Block 1 – APTA (2019)		
APTA-B1/1	PBN Approaches (with advanced capabilities)	
APTA-B1/2	PBN SID & STAR procedures (with advanced capabilities)	<i>A-RNP</i>
APTA-B1/3	GBAS CAT II/III precision approach procedures	<i>TBD</i>
APTA-B1/4	PBN to and from XLS transitions - with advanced capabilities	
APTA-B1/5	SID and STAR transitions	
APTA-B1/6	Simultaneous operations to parallel runways	
APTA-B1/7	PBN Operations for helicopters (with advanced capabilities)	<i>Available upon request by specific operation</i>

Egypt Preparation for ASBU B1

ASBU Block 1 – APTA (2019)		
APTA-B1/8	VPT RNAV Operations	<i>Ongoing after consultation with ECAA, national airlines and airports authorities</i>
APTA-B1/9	Performance-based aerodrome operating minima (Ground Infrastructure)	
APTA-B1/10	Performance-based aerodrome operating minima (Airborne equipment)	
APTA-B1/11	CCO and CDO (Advanced)	TBD

Post assessment of PBN Implementation

- Post-implementation reviews are conducted in order to ensure safe operations and identify any hot spots.
- Get feed back from users after implementation.
- Review reports from ATC and Aircrew on a daily basis to ensure that there are no safety considerations.
- Review IFPs after feed back from users
- A full review will be conducted every year in order to verify that all deliverables were met and to propose any refinements to the network.

Lessons Learned

- **Involve all stakeholders from the beginning**
 - ANSP's, airports, operators, regulator, MET, neighboring states, ICAO, IATA.
- **Implement PBN Procedures for close airports at the same time**
- **Training is crucial – ATC, Aircrew, Procedure designers**
- **Assign dedicated project team and develop work groups as necessary**

Challenges

- Time – there just is never enough.
- Continues evolution of PBN navigation specifications and their deployment in the ATM system.
- Software updates according to PANS-OPS new criteria.
- CBA for defining clear planning to implement GBAS in the medium Term Plan.

Challenges

- **Training and refresher training:**

Comprehensive training is required for operational personnel and Procedure designers.

- **Ensuring that PBN is environment-friendly**

- **Shortage of PANS OPS and Airspace planners experts**

Thoughts/Recommendations

- **Projects management, and time planning.**
- **Keeping up with the changing criteria**
- **Establish interactive coordination between stakeholders and plan for the Priorities**
- **Continuous quality checks on all data**
- **Plan training schedules well in advance to ensure readiness of controllers and aircrew**

Thank you

Ehab Raslan