AVIATION INFRASTRUCTURE FOR AFRICA
GAP ANALYSIS WORKSHOP

.....

Abuja, Nigeria 19-21 MARCH 2019

ASECNA INFRASTRUCTURE

www.asecna.aero

Les routes du ciel, notre métier

SUMMARY

1. INTRODUCTION
2. STATUS OF IMPLEMENTATION
3. SERVICE AND EQUIPMENT PLAN
4. CONCLUSION

SUMMARY

1. INTRODUCTION

2. STATUS OF IMPLEMENTATION

3. SERVICE AND EQUIPMENT PLAN

4. CONCLUSION

1. INTRODUCTION

CONTEXT

- Founded on December 12, 1959 in Saint-Louis (Senegal)
- Political will of Member States
- Cooperative management of their airspace and aeronautical utility platforms
- A true instrument of South-South and North-South integration and cooperation

1. INTRODUCTION

MISSION OF ASECNA

- Provide air navigation services to users that ensures the safety, regularity and efficiency of general air traffic
- Organize airspace and air routes
- Publish aeronautical information
- Realize the forecasts of aeronautical meteorology
- Provide firefighting and aircraft rescue services
- Ensure the maintenance in operational condition and the operation of equipment and facilities
- Develop specifications for functions, systems and means

1. INTRODUCTION

EXTERNAL CHALLENGES

- An average annual change of 4% in global air traffic, notwithstanding the effects of international economic and financial fluctuations
- Increasing requirements for the quality and cost of air navigation services
- African leadership in ATS service supplies
- The ICAO Strategic Objectives of the Global Air Navigation Plan (GANP)
- The Air Navigation Plan of the AFI Region in particular the declaration of Abuja
- The implementation of the PBN concept

SUMMARY

1. INTRODUCTION

2. STATUS OF IMPLEMENTATION

3. SERVICE AND EQUIPMENT PLAN

4. CONCLUSION

2. STATUS OF IMPLEMENTATION

- Airspace of 16.1 million km2 including:
  - 6 Regions of Flight Information (FIR)
  - 10 regional control centers,
  - 57 control towers,
  - 25 international airports
  - 76 national and regional airports.

- Staff
  - About 6000 agents (controllers, engineers, senior technicians, ...)
  - + 2500 agents of the national activities of the States

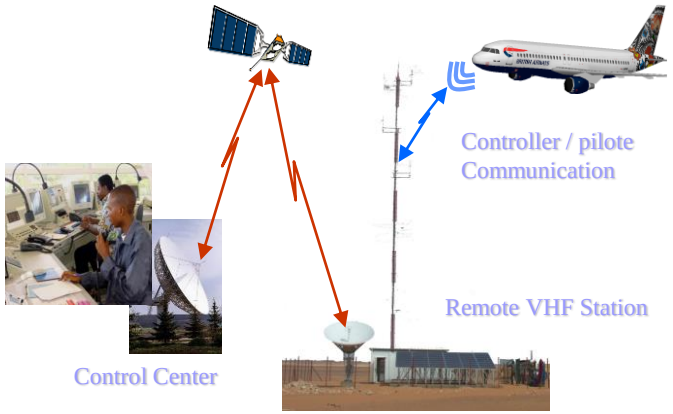
2. STATUS OF IMPLEMENTATION

- Own telecommunications network
- Extensive experience in installation, calibration and maintenance of air navigation aids
- Three training centers for civil aviation professions
- An ATR 42 calibration aircraft

2. STATUS OF IMPLEMENTATION

COMMUNICATION

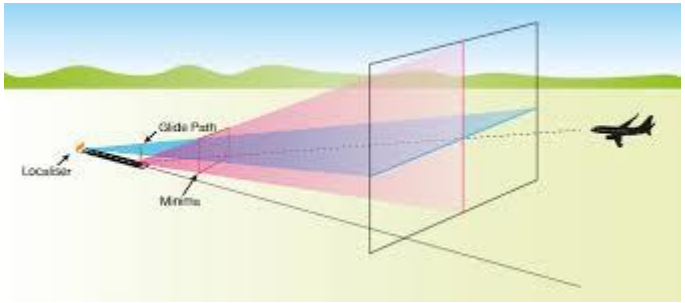
- Mobile Service:
  - VHF (more than 81 VSAT stations installed)
  - HF
  - CPDLC
  - INMARSAT suitcase
- Fixed Service:
  - RSFTA / SMT / AMHS
  - AIDC



2. STATUS OF IMPLEMENTATION

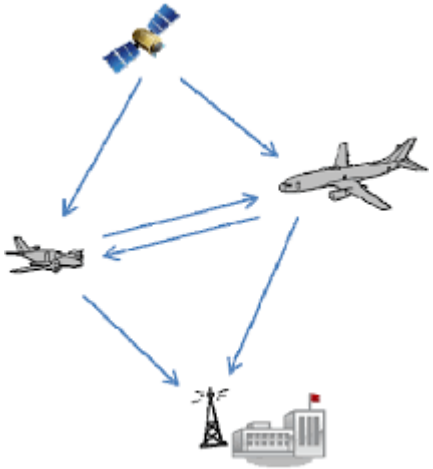
NAVIGATION

- NAVAIDS: Cat I on all major airfields
  - ILS - Glide
  - VOR
  - Landing and En-route DME



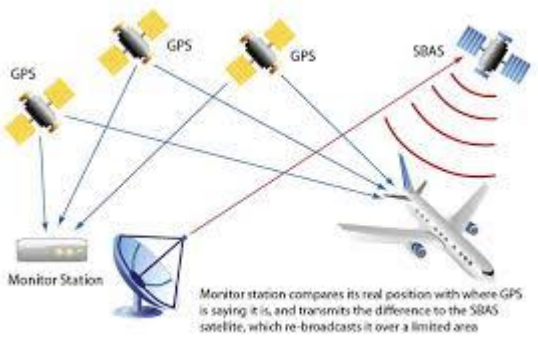
- Radar Guidance

2. STATUS OF IMPLEMENTATION



SURVEILLANCE

- 17 Secondary Mono Pulse Surveillance Radars at Major Airfields Coupled with TOPSKY ATC System
- ADS-B Terrestrial
- ADS-B Satellite in Experimentation
- Radar data exchange



2. STATUS OF IMPLEMENTATION

ENERGY BALISAGE

- Main aerodromes: CAT I markup
- Exception in Diass (Senegal) and Nouakchott (Mauritania) in CAT II
- Reinforcement by axial marking in Abidjan, Tananarive and Malabo
- Secondary aerodromes: Simplified approach system
- Standalone power supply on all platforms with power station or solar system

2. STATUS OF IMPLEMENTATION

METEOROLOGY

- Radiosonde Station
- Automatic observation system
- Synoptic Meteorological Observation Station
- Satellite weather data reception and processing system
- Wind station
- Classical instruments

2. STATUS OF IMPLEMENTATION

SAFETY AND FIRE FIGHTING

- Fire station on each platform
- Level of protection depending on the number of visitors to the platform
- Number of vehicles and Quantity of water depending on the insured level

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3. SERVICE AND EQUIPMENT PLAN

- Multi-year strategic planning
- Attached to the ICAO Global Air Navigation Plan (GANP)
- Synchronization procedure with the different modules of the ASBU blocks

Strategic Vision 2018 - 2032:

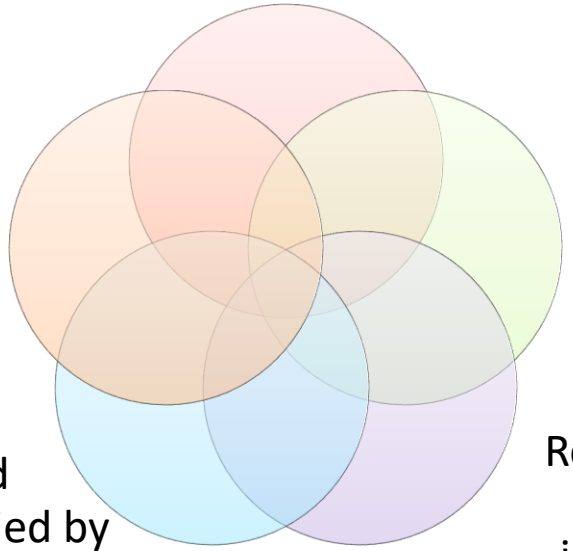
- **Phase 1 : 2018-2022 = 423,697 Mrds de FCFA**
- Phase 2 : 2023-2027 = 249,030 Mrds de FCFA
- Phase 3 : 2028-2032 = 221,505 Mrds de FCFA

3. SERVICE AND EQUIPMENT PLAN

INPUTS

Provisions of ICAO's global air navigation safety plans, including the GANP and the GASP

Needs of the Member States in satisfaction of their sovereign missions



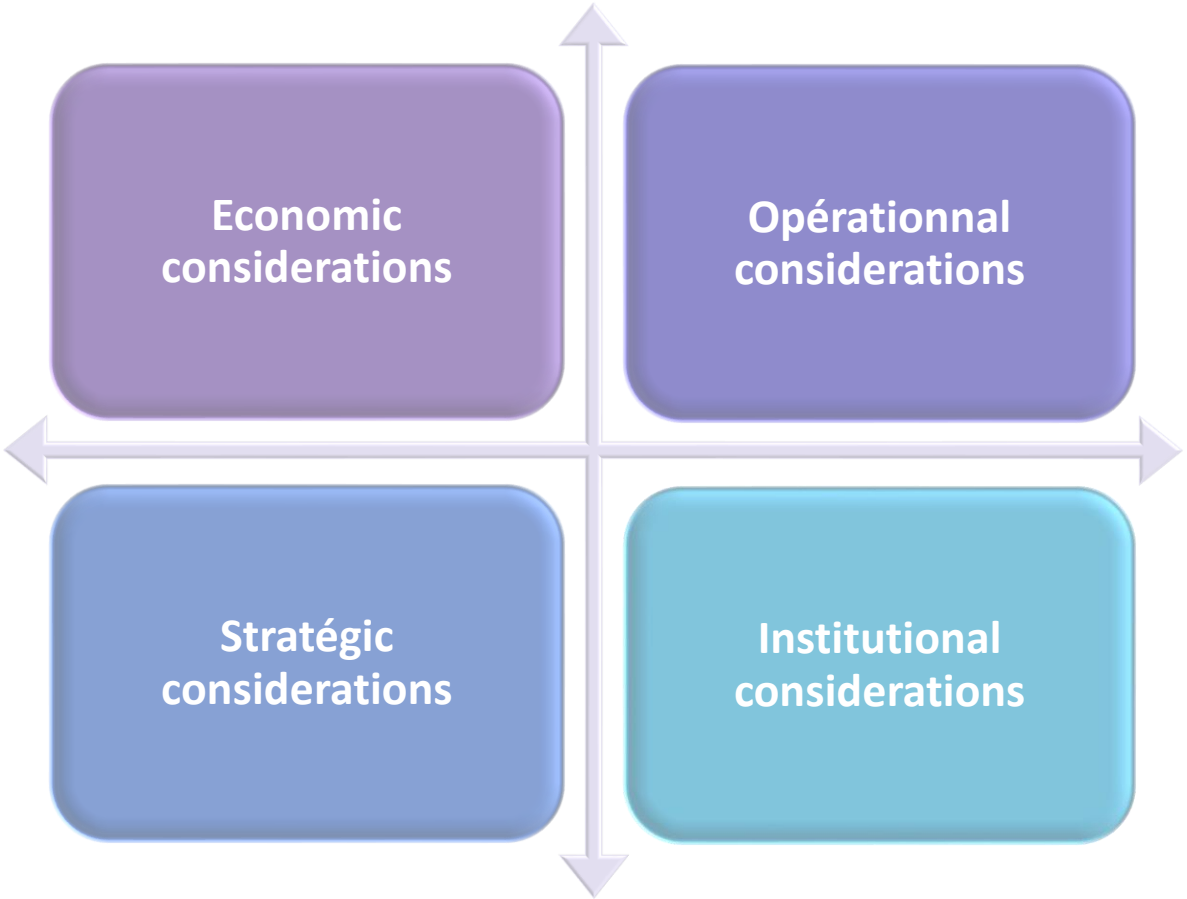
Provisions of the AFI regional plan integrating the modules of the four blocks of the ASBU

Deficiencies and shortcomings identified by different APIRG meetings

Revised Abuja targets for infrastructure implementation for the continent

3. SERVICE AND EQUIPMENT PLAN

INPUTS



3. SERVICE AND EQUIPMENT PLAN

INPUTS

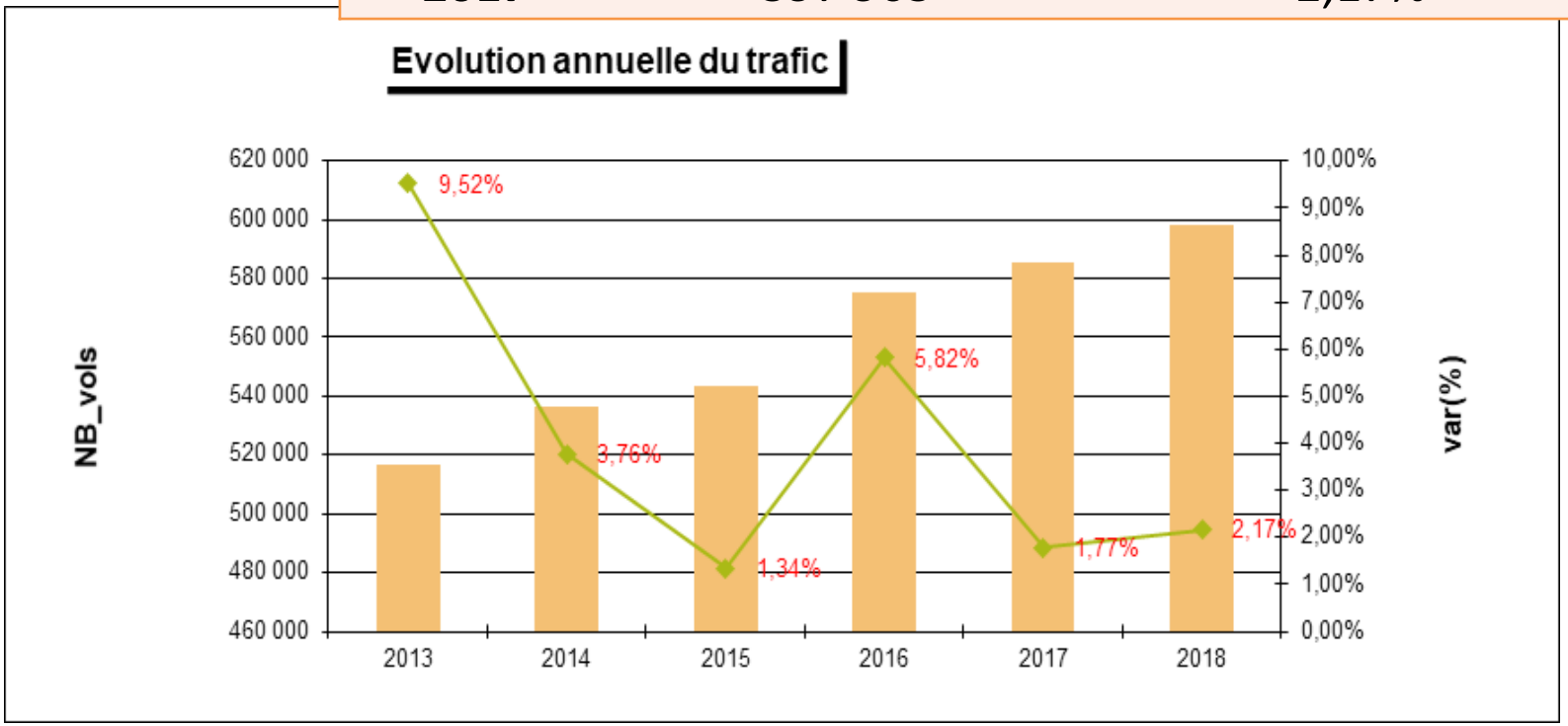
Users expectations : IATA

- Establishment of a memorandum of understanding covering several areas including flight safety
- Taking into account the opinions of users in the preparation of the Agency's service and equipment plans in order to best meet users' expectations

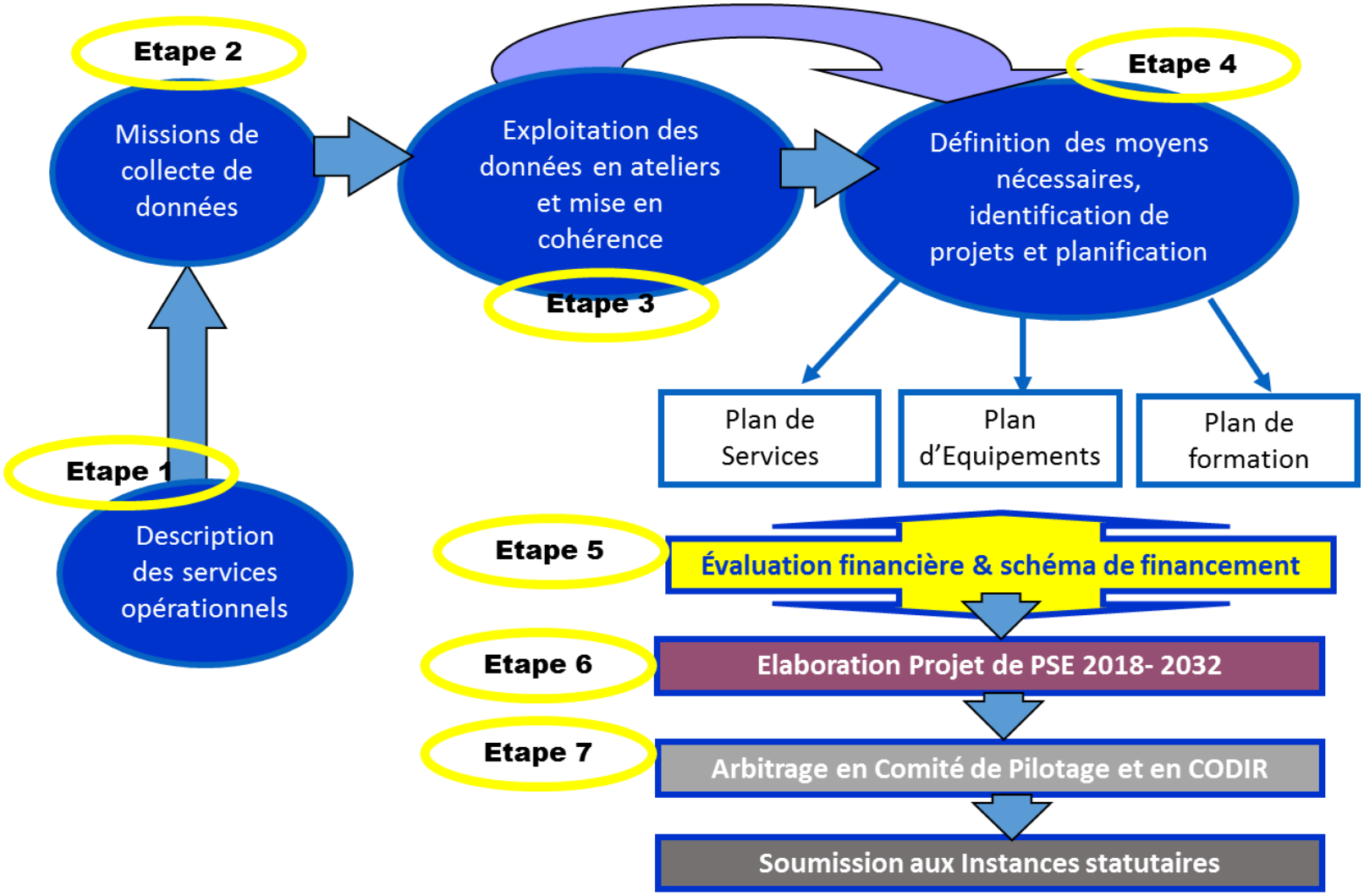
3. SERVICE AND EQUIPMENT PLAN

INPUTS

	Number of flights	Rate of growth
2013	536 253	3,76%
2014	543 439	1,34%
2015	575 040	5,82%
2016	585 234	1,77%
2017	597 905	2,17%



3. SERVICE AND EQUIPMENT PLAN



3. SERVICE AND EQUIPMENT PLAN

PSE 2018-2022 by Domain

Domains	Number of projects by domain and year					Total
	2018	2019	2020	2021	2022	
AIS	12	1	1	0	0	**14**
AOP	115	41	19	15	3	**193**
ATM	10	8	2	1	4	**25**
COM	12	14	1	3	1	**31**
MET	8	3	1	1	3	**16**
NAV	8	10	2	1	0	**21**
SAR	2	1	0	0	0	**3**
SUR	6	7	0	0	1	**14**
TRN	52	13	11	3	2	**81**
TOTAL	**225**	**98**	**37**	**24**	**14**	**398**

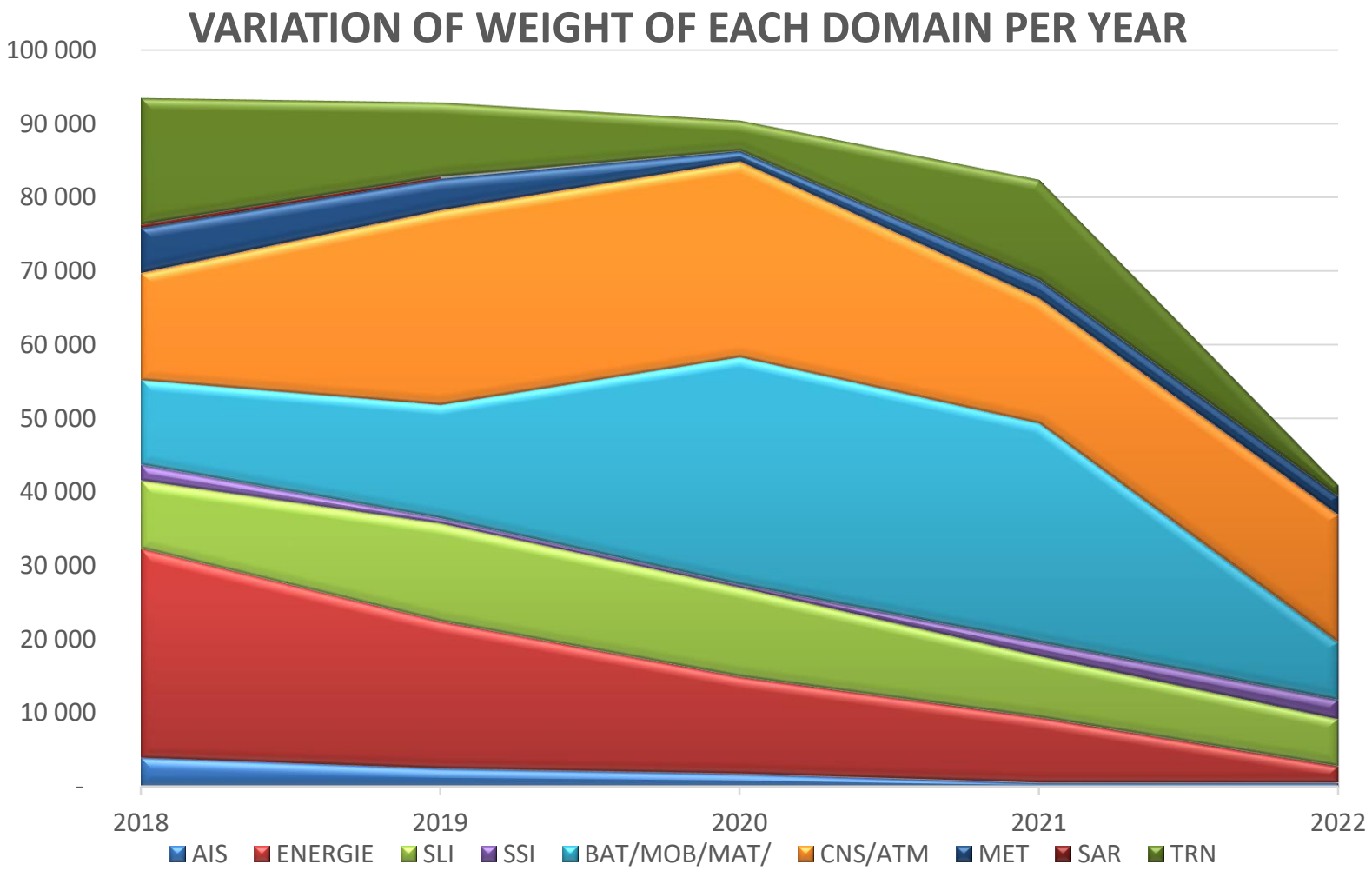
3. SERVICE AND EQUIPMENT PLAN

PSE 2018-2022 by Domain

	2018	2019	2020	2021	2022
AIS	3 880	2 450	1 700	500	500
ENERGY	28 400	19 920	13 150	8 850	2 250
SLI	9 206	13 309	12 120	8 358	6 415
SSI	2 101	655	380	1 830	2 580
BAT/MOB/MAT	11 605	15 485	30 950	29 765	7 815
CNS/ATM	14 506	26 370	26 550	16 950	17 330
MET	6 075	4 260	1 400	2 520	2 500
SAR	450	300	-	-	-
TRN	17 192	10 050	4 100	13 530	1 550

3. SERVICE AND EQUIPMENT PLAN

PSE 2018-2022 by Domain



3. SERVICE AND EQUIPMENT PLAN

PSE 2018-2022 : Correspondence ASBU Block 0

Performance Improvement Areas	Module Description	Module	ASECNA implementation level	Comments
Aerodrome operations	Improved traffic flow thanks to sequencing (AMAN/DMAN)	B0 RSEQ	Not implemented; Usually only one runway on our airports	Not applicable
	Optimization of approach procedures including vertical guidance	B0 APTA	APV BARO/VNAV and LNAV achieved on 72% of airports	Experimentation on SBAS and GBAS
	Increased runway flow through application of optimized separation measurements based on wake turbulence	B0 WAKE	Not implemented;	Non prioritaire sur terrain ASECNA
	Safety and efficiency of surface operations (A-SMGCS Level 1-2)	B0 SURF	Not implemented;	Non-priority on ASECNA field but implemented on new airports (DIASS DONSE NKC)
	Improved airport operations thanks to the CDM-airport	B0 ACDM	Not fully implemented; But ongoing implementation of track safety teams	

3. SERVICE AND EQUIPMENT PLAN

PSE 2018-2022 : Correspondence ASBU Block 0

Performance Improvement Areas	Module Description	Module	ASECNA implementation level	Comments
Interoperable data systems	Increased interoperability, efficiency and capacity through ground floor integration	B0 FICE	AIDC in progress. Functional AMHS on some sites; Search in connectivity with OLDI	
	Improved service through digital management of aeronautical information	B0 DATM	AIXM and e-AIP being implemented as well as the AIMANT project	
	MTO Intelligence Supporting Enhanced Efficiency and Operational Security	B0 AMET		
ATM collaborative mondiale	Improved operations with better flight paths En-route	B0 FRTO	Iflex available Implementation of AORA in Oceanic FIR	
	Improved traffic flow through planning based on an overview of the network	B0 NOPS	Not implemented.	Not priority
	Initial Ground Monitoring Functionality	B0 ASUR	SSR, ADS-C ADS-B	

3. SERVICE AND EQUIPMENT PLAN

PSE 2018-2022 : Correspondence ASBU Block 0

Performance Improvement Areas	Module Description	Module	ASECNA implementation level
ATM collaborative mondiale	Awareness of the situation of air traffic (ATSA)	B0 ASEP	ASECNA not concerned
	Improved access to optimal flight levels through Climb/Descent procedures using ADS-B	B0 OPFL	ASECNA not concerned
	ACAS Improvements	B0 ACAS	ASECNA not concerned
	Increased efficiency of ground safety nets	B0 SNET	Implemented (FPCP, STCA, APW, DIAW, etc..)
Effective flight trajectories	Flexibility and efficiency in descent profiles (CDO)	B0 CDO	On going
	Improved security and efficiency with the initial application of En-route data links	B0 TBO	CPDLC
	Improved flexibility and efficiency in starting and continuous profiles (CCO)	B0 CCO	On going

3. SERVICE AND EQUIPMENT PLAN

PSE 2018-2022 : Correspondence ASBU other Blocks

Performance Improvement Areas	BLOC 1 (2019)	BLOC 2 (2025)	BLOC 3 (2031 and more)	ASECNA initiatives planned in PSE 2018-2022
PIA 1 Aerodrome operations	B-APTA B1-RATS			B0-APTA : VOR/DME, ILS, SBAS : • Progressive deployment of SBAS CAT-I services from 2023 • Start phase B study in 2018 • GBAS: Continuation of research and development; • Development of APV Baro-VNAV procedures; B1-RATS : Remote Towers.
PIA 2 Interoperability of systems and data on a global scale	B1-FICE	B2-FICE		AIDC, AMHS-VSAT Network
	B1-DATM	B2-SWIM		AIMANT Project implementation ; Migration to AIXM 5.1
	B1-SWIM			Implementation in progress
	B1-AMET			Implementation of the SAOMA (Automatic Aerodrome Meteorological Observation System) and SAAPI projects

3. SERVICE AND EQUIPMENT PLAN

PSE 2018-2022 : Correspondence ASBU other Blocks

Performance Improvement Areas (PIA)	BLOC 1 (2019)	BLOC 2 (2025)	BLOC 3 (2031 and more)	Initiatives de l'ASECNA prévues au PSE 2018-2022
PIA 3 Optimizing the capacity and flexibility of flight trajectories	B1-FRTO			**PBN, FUA, Iflex** Optimization of Basic PBN-GNSS Approach Procedures as primary En Route and additional TMA areas;
				iFLEX Routes ; RNAV5 ; PBN routes, RNP4
	B1-NOPS	B2-NOPS	B3-NOPS	**ATFM** : implementation of an air traffic flow management center ; ATN ; AMHS
				Projets RADARs, ADS-C/CPDLC, ADS-B Terrestre, ADS-B space based
	B1-SNET			Backup nets associated with ATM systems (FPCP, STCA, APW, DIAW, etc..)
PIA 4 Effectiveness of flight paths	B1-CDO	B2-CDO		Implementation of continuous descent procedures (CDO)
	B1-CCO			Implementation of continuous climb procedures (CCO)
	B1-TBO		B3-TBO	ADS-C/CPDLC
	B1-RPAS	B2-RPAS	B3-RPAS	Specific procedures with the French army in Niamey

3. SERVICE AND EQUIPMENT PLAN

MAJOR PLANNED PROJECTS (1)

- Optimization and modernization of AFISNET and CAFSAT networks
- Interoperability with SADC and NAFISAT networks
- CPDLC consolidation
- Implementation of AIDC
- Implementation of the AMHS
- SBAS and GBAS experimentation

3. SERVICE AND EQUIPMENT PLAN

MAJOR PLANNED PROJECTS (2)

- Implementation of PBN
- Implementation of terrestrial and satellites ADS-B
- Consolidation of the FDPS
- Interconnection of surveillance systems
- Implementation of Aeronautical Information Publication Automation Systems (e-TOD and AMDB)

3. SERVICE AND EQUIPMENT PLAN

MAJOR PLANNED PROJECTS (3)

- Creation and Completion of a Geographic Database (GIS)
- Implementation of the Integrated Meteorological Observation Data System (WIGOS) in the ASECNA Member States
- Transition from MSG systems to the third generation METEOSAT system
- Acquisition of appropriate systems for the detection of wind shear phenomena and stormy homes

3. SERVICE AND EQUIPMENT PLAN

MAJOR PLANNED PROJECTS (4)

- Renewal of Rescue and Fire Fighting means
- Implementation of the mixed electrical power supply systems of the centers (solar and thermal power plant)
- Construction and rehabilitation of technical buildings (technical block, SLI bases, etc ...)
- Improvement of training capacities of training centers (EAMAC, ERSI and ERNAM)
- Acquisition of a new aircraft for calibration of facilities and control of established flight procedures

SUMMARY

1. INTRODUCTION

2. STATUS OF IMPLEMENTATION

3. SERVICE AND EQUIPMENT PLAN

4. CONCLUSION

4. CONCLUSION

Through its 2018-2022 Services and Equipment Plan (PSE), ASECNA plans to invest nearly 500 billion over five years to improve its aeronautical infrastructure to meet the operational needs of users and taking into account the objectives of the Statutory Instances.

Its PSE takes into account the international and regional orientations contained in the Global Air Navigation Plan and the AFI Plan.

4. CONCLUSION

The meeting is invited to :

- Take note of planning information for the implementation of ASECNA investment projects ;
- Encourage interoperability of systems and harmonization of procedures for better coordination of services to be provided.

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