



Sudan PBN Implementation Plan

PBN SG/2

Shram El Sheikh, Egypt, 22-25 FEB 2016

Outline

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Introduction

Instrument Flight •
Procedure project Start in
2012 by a signing contract
with ENAC/CGX Aero
(French company)

Introduction

Establish procedure design unit •

IAP for 13 aerodromes •

7 Airports Completed ➤

4 Airports in progress ➤

2 Airports remaining ➤

SIDs and STARs for 13 aerodromes •

CCO and CDO for 13 aerodromes •

International Aerodromes

There are 4 international airports : ●

Khartoum (HSSS) airport ●

ILS approach R/W 36 CAT 2 ➤

ILS approach R/W 18 Cat 2 (suspended) ➤

VOR/DME approach R/W 36 & 18 ➤

VOR approach only for R/W 36&18 ➤

RNAV approach (LNAV only) for R/W 36 & 18 ➤

SIDs & STARs RNAV 1 ➤

Approval in progress ➤

International Aerodromes

There are 4 international airports : ●

Port Sudan (HSPN) airport ●

ILS approach R/W 35 CAT 1 ➤

VOR/DME approach R/W 35 & 17 ➤

RNAV approach (LNAV only) for ➤
R/W 35 & 17

SIDs & STARs RNP 1 ➤

Approval in progress ➤

International Aerodromes

There are 4 international airports : ●

Nyala (HSNN) airport ●

VOR/DME approach R/W 22 & 04 ➤

RNAV approach (LNAV only) for ➤
R/W 04 & 22

SIDs & STARs RNP 1 ➤

Approval in progress ➤

International Aerodromes

There are 4 international airports : ●

El Obied (HSOB) airport ●

VOR/DME approach R/W 01 & 19 ➤

RNAV approach (LNAV only) for ➤
R/W 01 & 19

SIDs & STARs RNP 1 ➤

Approval in progress ➤

Domestic Aerodromes

There are 9 domestic airports: ●

El genana (HSSG) Airport: ●

VOR/DME approach R/W 04 & 22 ➤

RNAV approach (LNAV only) for ➤
R/W 05 & 23

SIDs & STARs RNP 1 ➤

Approval in progress ➤

Domestic Aerodromes

There are 9 domestic airports: ●

El fasher (HSFS) Airport: ●

VOR/DME approach R/W 05 & 23 ➤

RNAV approach (LNAV only) for ➤
R/W 05 & 23

SIDs & STARs RNP 1 ➤

Approval in progress ➤

Domestic Aerodromes

There are 9 domestic airports: ●

Marawai(HSMN) Airport: ●

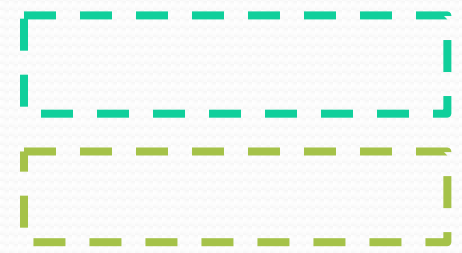
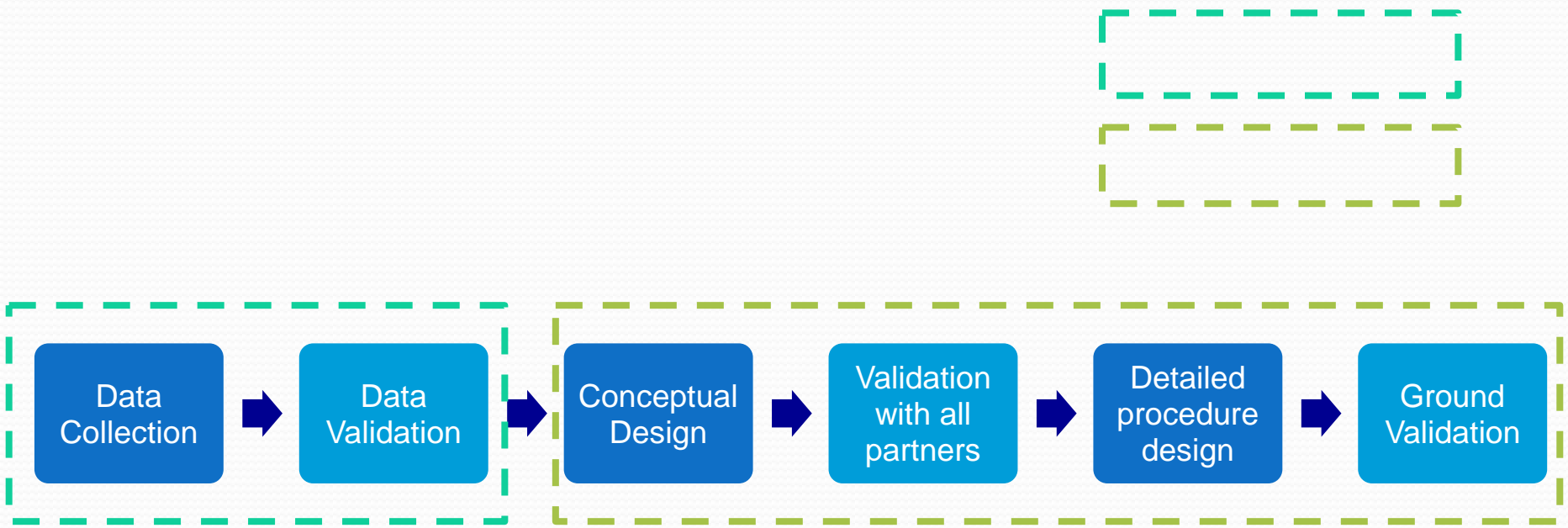
ILS approach R/W 02 & 20 CAT 3 ●

VOR/DME approach R/W 02 & 20 ●

RNAV approach (LNAV only) for R/W 02 & ●
20

SIDs & STARs RNP 1 ●

Approval in progress ●



Domestic Aerodromes

There are 9 domestic airports: ●

Kasala(HSKA) Airport: ●

VOR/DME approach R/W 02 & 20 ➤

RNAV approach (LNAV only) for ➤
R/W02 & 20

SIDs & STARs RNP 1 ➤

Conceptual Design ➤

Domestic Aerodromes

There are 9 domestic airports: ●

El damazin(HSDZ) Airport: ●

RNAV approach (LNAV only) for ➤
R/W₁₇ & 35

Only RNP APCH (No NAVAIDs) ➤

SIDs & STARs RNP 1 ➤

Conceptual Design ➤

Domestic Aerodromes

There are 9 domestic airports: ●

Kadugli(HSKA) Airport: ●

RNAV approach (LNAV only) for ➤
R/Wo6 & 24

Only RNP APCH (No NAVAIDs) ➤

SIDs & STARs RNP 1 ➤

Conceptual Design ➤

Domestic Aerodromes

There are 9 domestic airports: ●

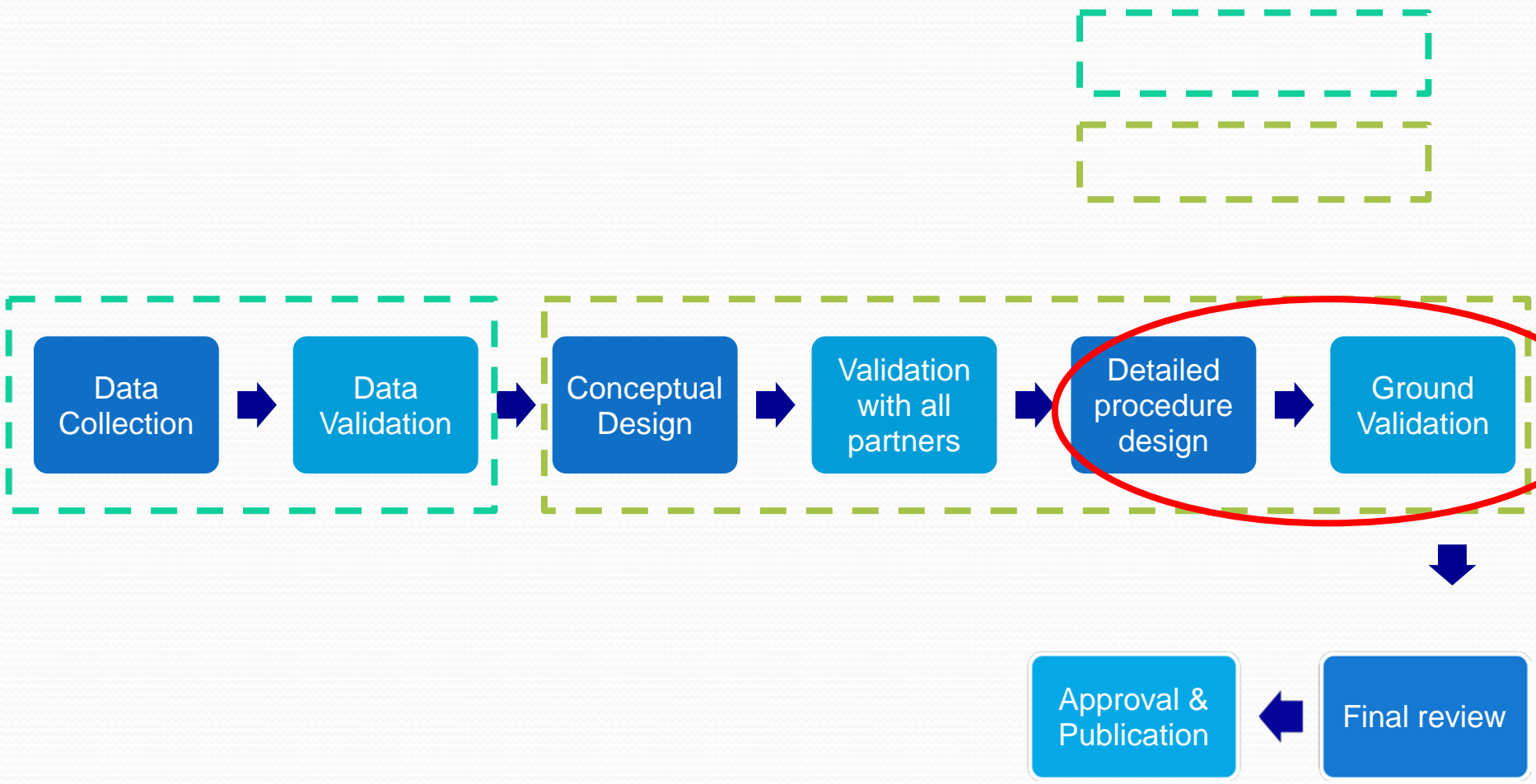
Dongola(HSDN) Airport: ●

VOR/DME approach R/W 02 & 20 ➤

RNAV approach (LNAV only) for ➤
R/W 02 & 20

SIDs & STARs RNP 1 ➤

Conceptual Design ➤



Domestic Aerodromes

Remaining 2 Airports: ●

El daien (HSDI) and Zalengi ●
(HSZN)

IAP and SIDs & STARs will be ●
carried out **by the end of**
2017

Remarks

Baro-VNAV procedures will be •
designing for Khartoum, Port
Sudan, El fasher, El obied, El
genana, Nyala and Marwari by
the **end of 2016**.

Challenges

Approval Process ●

Data collection and ●
construction works for
some airports.

SUDAN AIRSPACE

The second step is redesign of the Sudan airspace •

This step represents a significant work • that must be carried by SCAA with the assistant of CGX AERO and DSNA services (The French Aeronautical Expertise)

Sudan Current Situation

RNAV Current status in Sudan (routes) ●

The following RNV routes are established ➤
within Khartoum Airspace:

Route UM863 as RNAV route linking the ➤
Gulf states with West Africa

Route UT124 as RNAV route linking East ➤
Africa with Europe

Sudan Current Situation

RNAV Current status in Sudan (routes) •

Routes UQ584 as RNAV route linking the ➤
Gulf with West Africa down South America

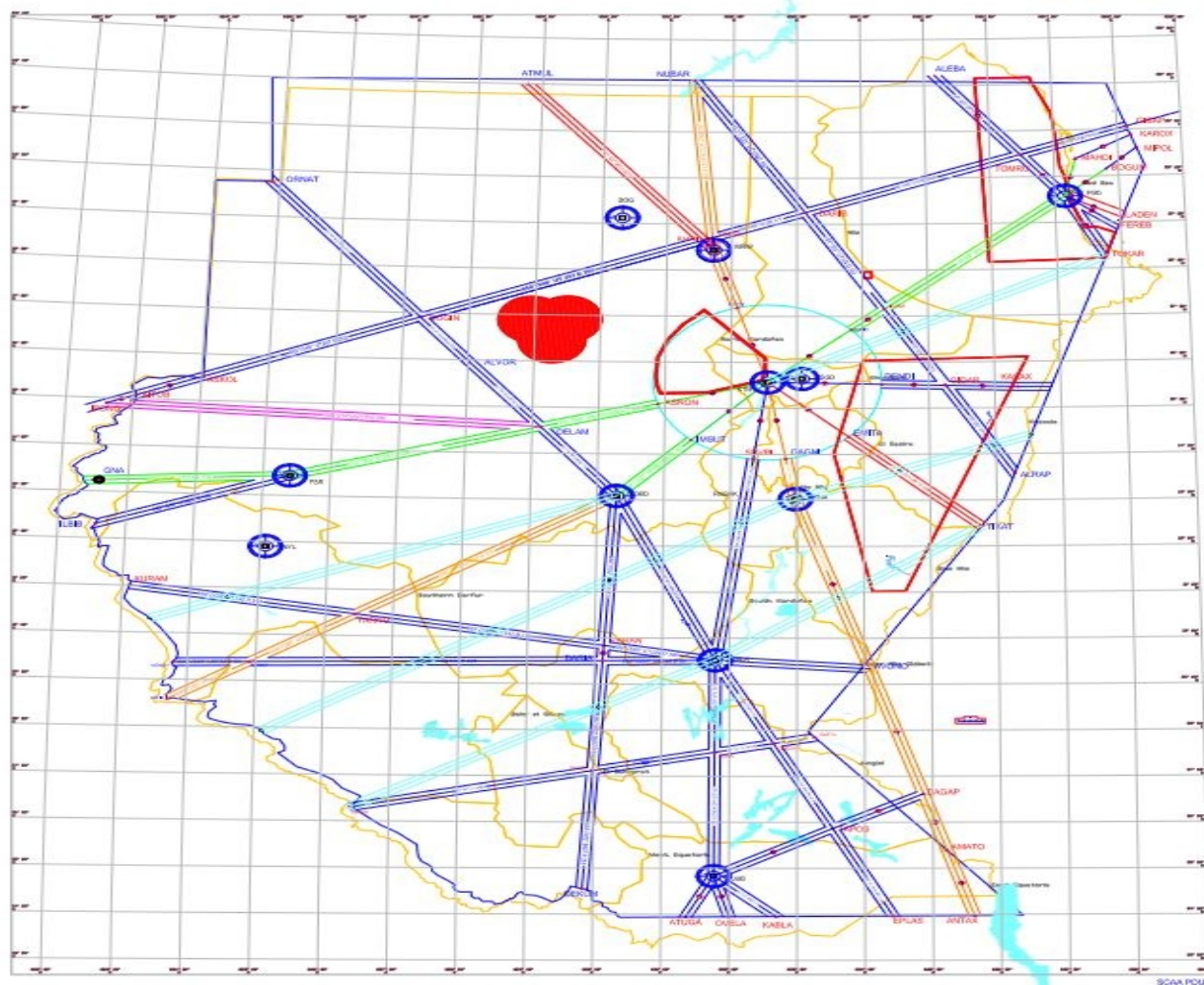
Route UT535 linking Juba with East Africa. ➤

Route UT139 as RNAV 10 linking east Africa ➤
with West Africa.

Route UT142 linking East Africa with the ➤
North West Africa.

Sudan current ATS route

Khartoum FIR New Routes Network





EGYPT

Lake Nasser

LIBYA

Mecca

Port Sudan
Red Sea

CHAD

Atbarah

Khartoum

ERITREA

Asmara

Al Fashir

Mekkele

SUDAN

Sobat Nile
White Nile
Sudd Nile

ETHIOPIA

Djire Dawa

Addis Abbaba

Asela

Gaba

Ndole

CENTRAL AFRICAN REPUBLIC

Wau

Juba

Lake Turkana

Bangassou

CONGO

Congo R.

UGANDA

KENYA

Bumba

Lake Albert

Target

- Design safe and efficient new structure for Sudan FIR compliant with:
 - National PBN road map
 - ICAO MID & AFI plan
 - ASBU Methodology
 - National and international requirements
 - Manage growth and evolution of the traffic up to 2025



Target

- Manage HADJ period •
- Reduce ATC workload •
- Increase the airspace capacity •
- Improve the safety and efficiency of operations •
- Reduce the flying time for crossing Sudan FIR •

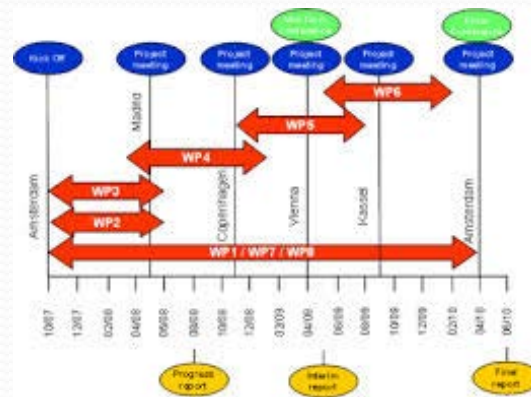
Roadmap - 3 main elements



**Experienced
team**



A methodology



**A calendar
(6 to 8 months)**

Roadmap - A methodology

STAGE 1 - ANALYSIS

Data Collection

Strategy definition



STAGE 2 – DESIGN STUDY

Airspace design activities

Experimentation



STAGE 3 – IMPLEMENTATION

Operational implementation

Sensitization

Remarks

Upper airspace will be **RNAV** •
routes.

Lower airspace will be •
conventional routes

Flexible routes will be •
consider above flight level 390

Sudan ATS Surveillance System

The Surveillance System in Sudan include the following: •

6 MSSR antennas •

PORT SUDAN •

DONGOLA •

KHARTOUM •

EL OBEID •

AL FASHER •

AD-DAMAZIN •

Sudan ATS Surveillance System

The Surveillance System in Sudan include the following: •

11 ADS-B sites •

KHARTOUM •

ATBARA •

ATROUN (not integrated) •

NYALA •

KADULI(not integrated) •

MARRAW •

KASSALA (not integrated) •

OBIED •

PORT SUDAN (not integrated) •

FASHERR (not integrated) •

ELDAMAZIN (not integrated) •

DONGLA (not integrated) •

Activities during the Project

Knowledge transfer to SCAA •

During the period of the project there are •
three workshops on PBN will be conducted
by CGX in Khartoum for:

ATCOs •

Pilots •

Civil aviation staffs in related fields



Conclusion

The new design would have a cross-border impact, but it has positive effect for all airlines flying over HSSS FIR so that we need support from:

All neighboring countries •

ICAO MID/AFI offices •

CANSO and •

ITATA •

Thanks for your •
attention

