ICAO WACAF Workshop

1st – 4th September 2015

Douala ICAO Workshop

Kalibo Study Case

September 1st to 4th 2015, Douala

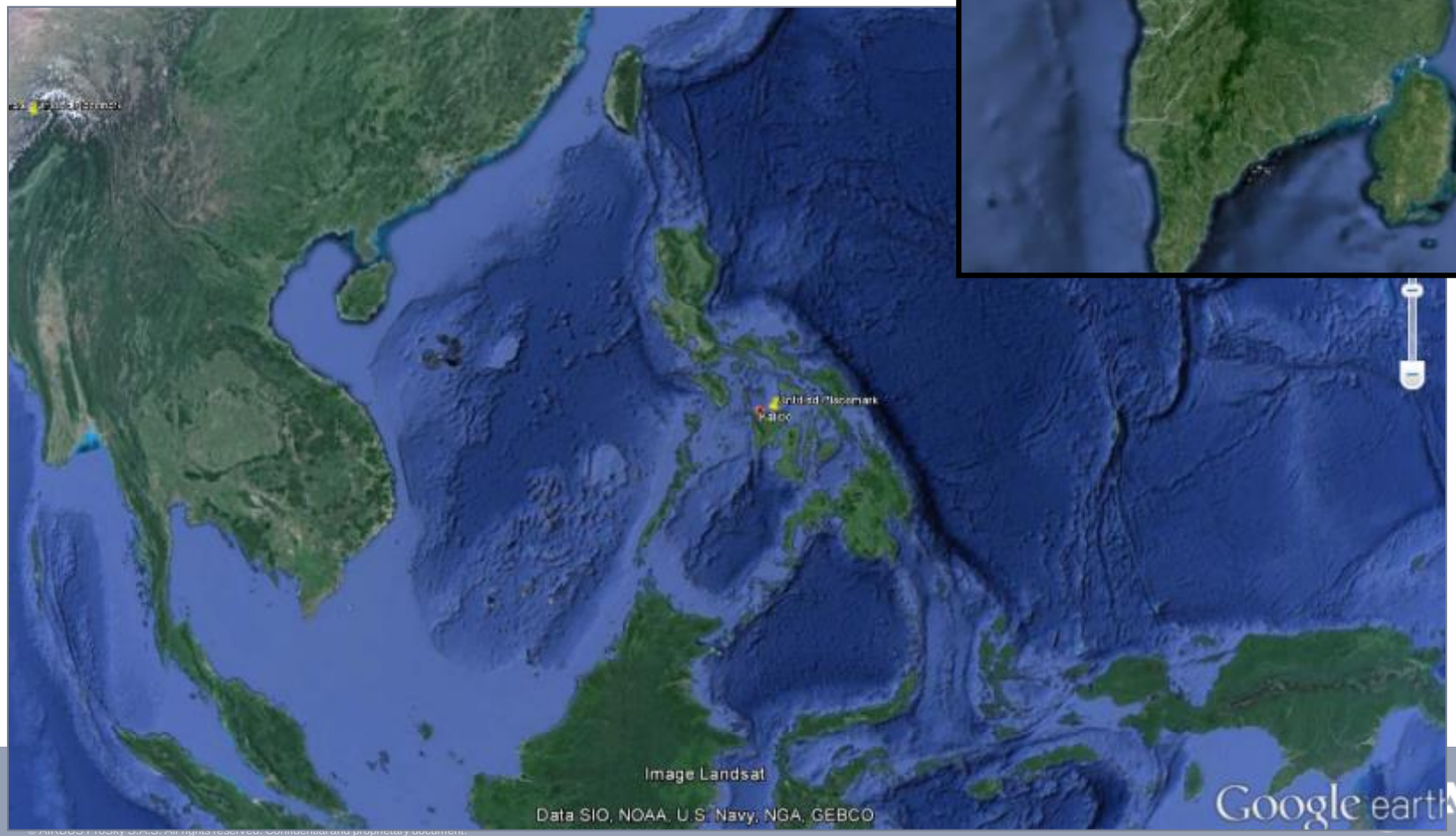
AIRBUS

Objective

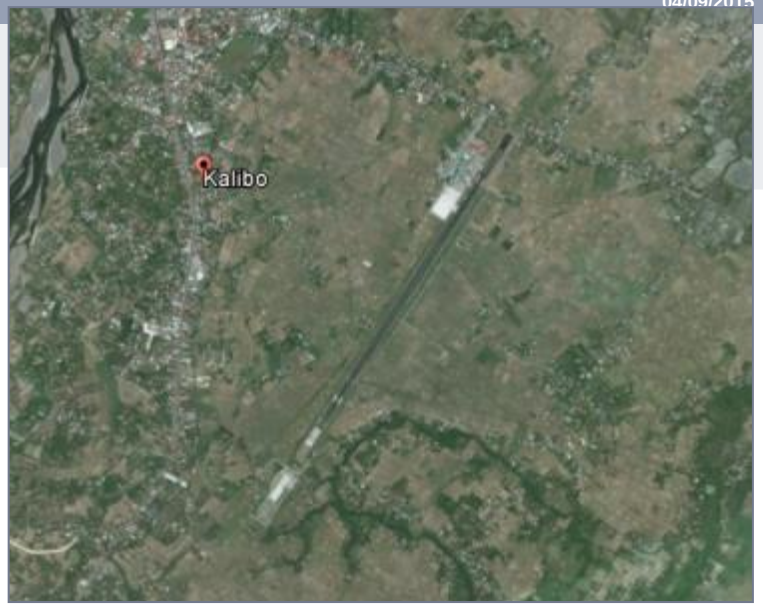
- Objective of the Study Case:
  - To apply the ICAO 9906 steps and Methodology to a concrete case
  - To go deeper in a concrete case, by analyzing & identifying:
    - ✓ The existing airport procedures – Potential issues and ways of improvement
    - ✓ Which PBN Nav Spec may be used to improve the existing procedures

Study Case – Kalibo airport

- Kalibo airport is located in Philippines

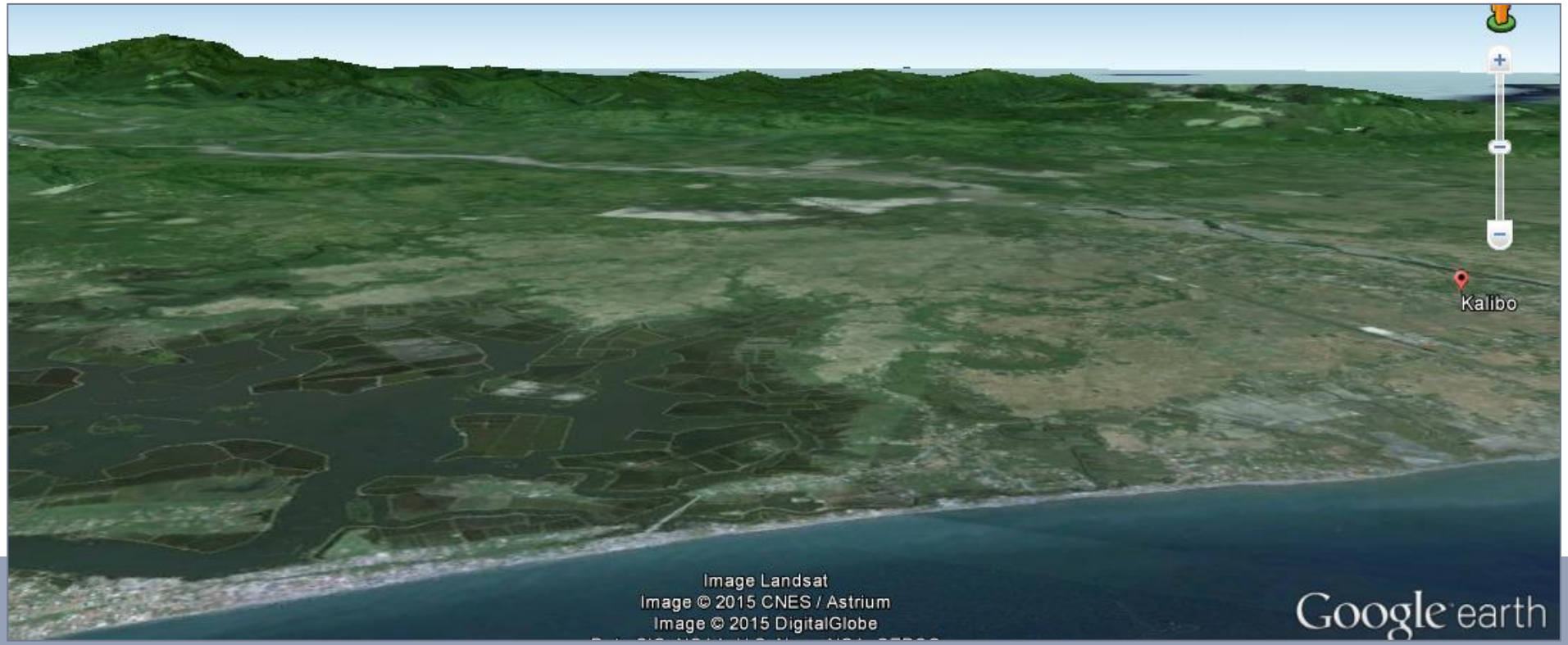


Study Case – Kalibo airport



Airport surrounded by:

- North: Sea
- South-West & West: Mountains



Kalibo airport – Main features

- VFR/IFR traffic
- Non Radar Environment
- Traffic flow:
  - About 25-30 aircraft per day
  - Mostly Airbus A320 aircraft (80%) and 737-800 (from Russia and Taipei), ATR and Dash Q400
- Existing procedures:
  - See AIP

Kalibo airport – Study case

Step 1 - Initiation

- Starting point of the “Future Project”

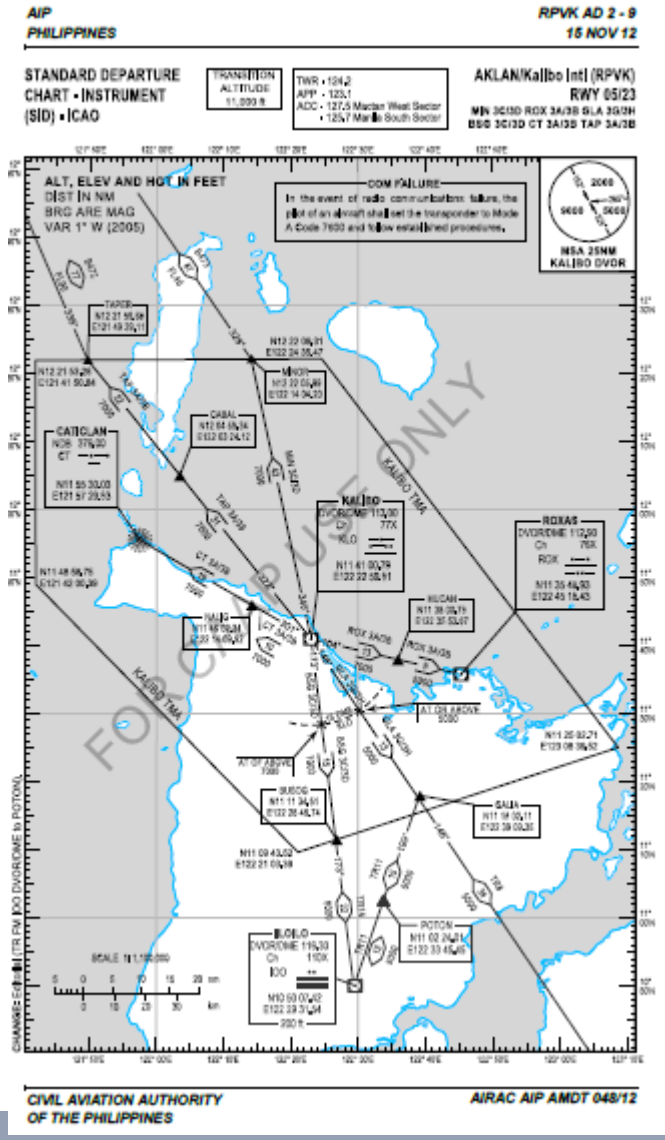
→ Why looking at this airport?

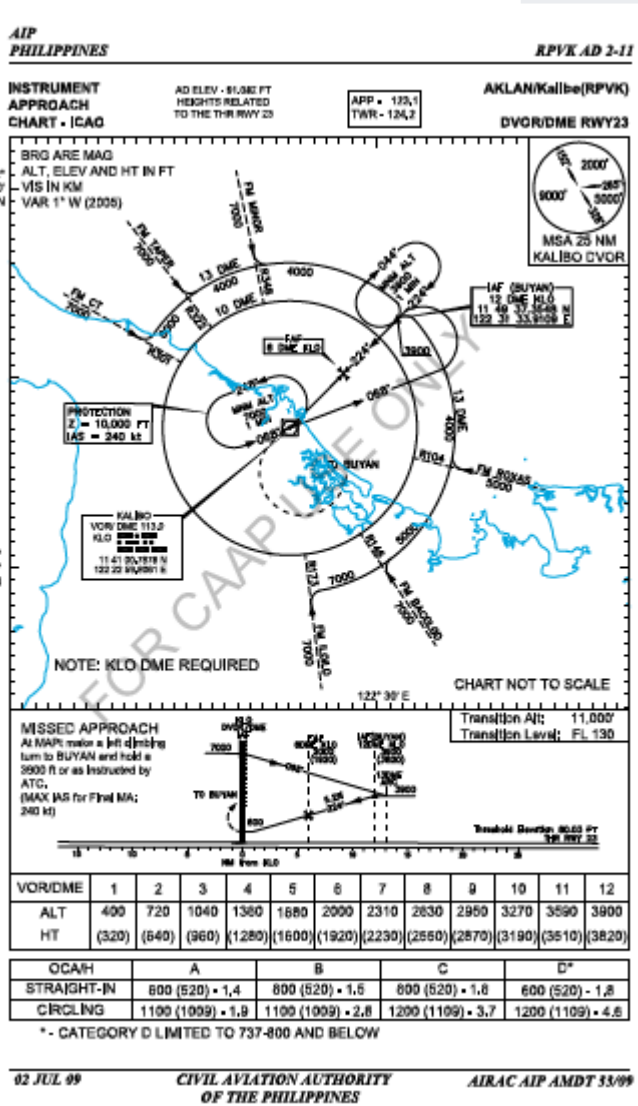
Authorized material:

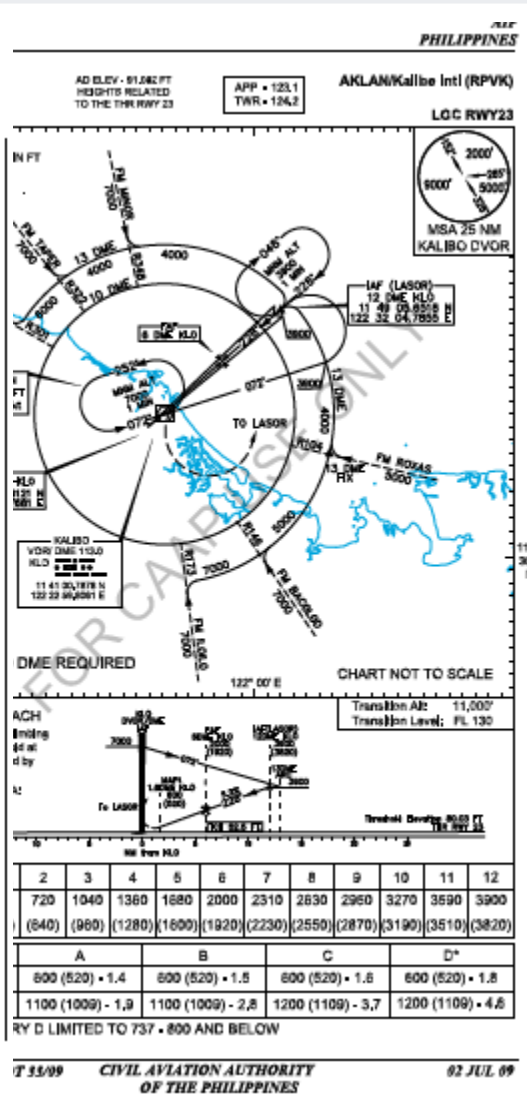
✓ AIP

✓ Weather data

AIP

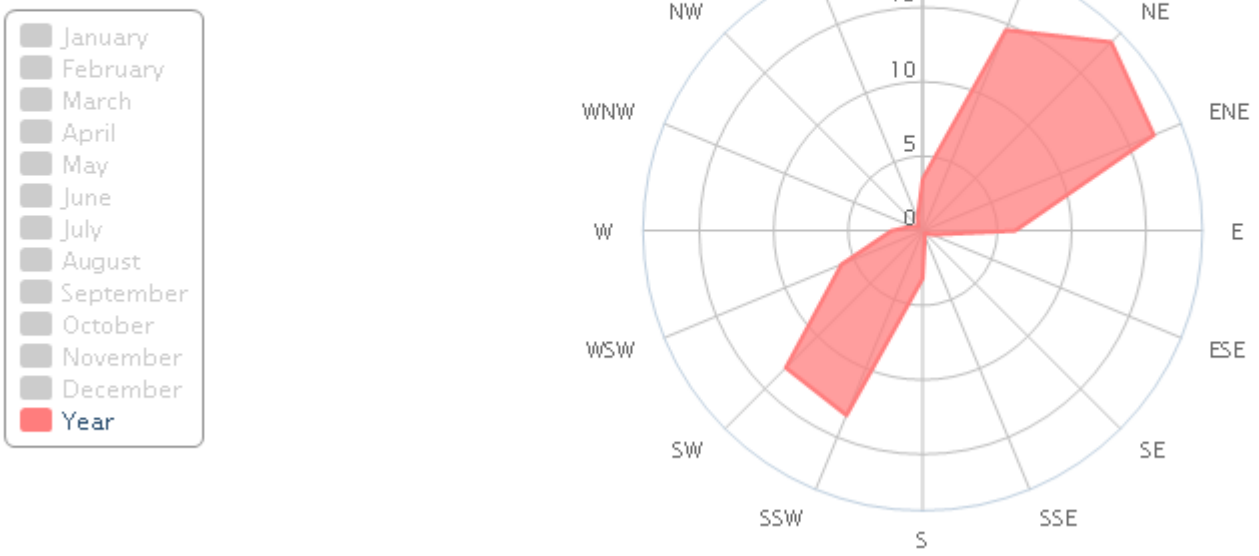






Weather data

Month of year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
	01	02	03	04	05	06	07	08	09	10	11	12	1-12
Dominant Wind dir.													
Wind probability >= 4 Beaufort (%)	63	49	45	22	6	18	26	35	27	19	31	56	33
Average Wind speed (kts)	13	11	11	9	6	8	9	10	9	8	8	12	9
Average air temp. (°C)	27	27	28	29	30	29	29	28	28	29	29	28	28



Step 1 - Initiation

- Identification of potential :
  - Operational issues (on both runways)
  - Safety issues

- AIP and existing procedure:

  Give your analyse and feedback?

  Ways of potential :

  - Operational improvement
  - Safety improvement

Step 1 - Initiation

- Identification of potential :
  - Operational issues :
    - ✓ Minima ?
    - ✓ Traffic separation ?
    - ✓ Payload ?
    - ✓ Terrain Awareness triggered ?
    - ✓ Fuel consumption ?
    - ✓ Navaids not reliable / Failure ?
  - Safety issues :
    - ✓ Procedure not coded, higher crew workload
    - ✓ Circling: Visual Approach and manual flying – Does not facilitate fully stabilized approach

Step 1 - Initiation

- Who should be involved?
- Who may provide operational feedback and recommendations?

Step 1 - Initiation

- Who should be involved?
- Who may provide operational feedback and recommendations?
- Outputs
  - GO / NO GO? Pas de décision encore sur la solution mais Go pour lancement.
  - Point focal CAA, formaliser (compte rendu réunion, fiche de présence)
  - Identifier besoins à venir, écheances, contrats nécessaire à mettre en place
- Stakeholders
  - CAA, ANSP(s) incluant ATC, compagnie(s) aérienne(s), exploitant aéroport, militaires (aérien et autres zones), collectivités locales, aéroclubs, aéroports voisins, espaces aériens voisin,

Step 2 – Data Collection

- Which data?

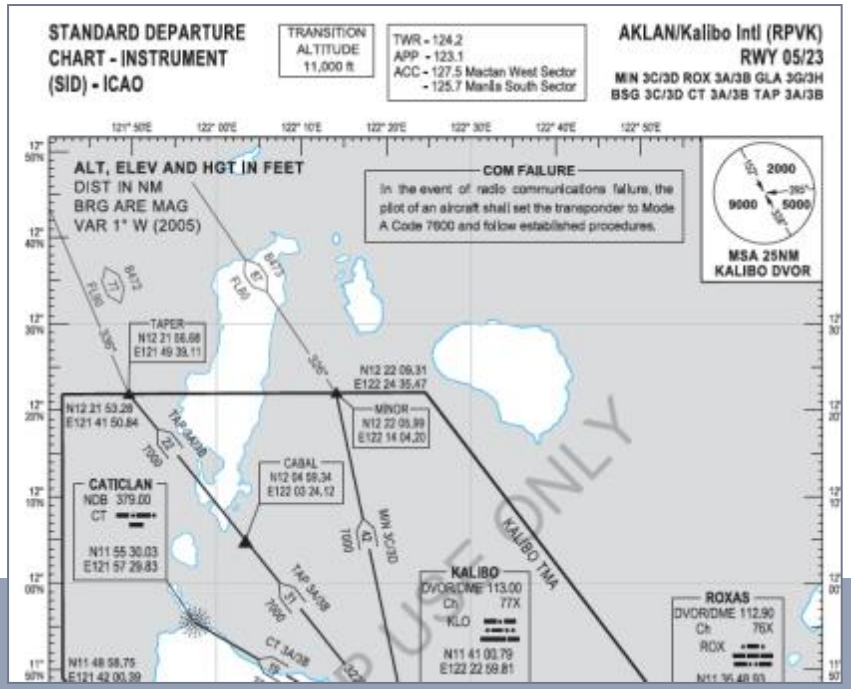
Step 2 – Data Collection

- Which data?
  - ✓ Data collected in the Step 1 – Initiation
    - Operational / Safety Feedback
      - Operators
      - ATC

RPVK AD 2.12 RUNWAY PHYSICAL CHARACTERISTICS

Designations RWY NR	TRUE BRG	Dimensions of RWY	Strength (PCN) and surface of RWY and SWY	THR coordinates RWY end coordinates THR geoid undulation	THR elevation and highest elevation of TDZ of precision APP RWY
1	2	3	4	5	6
05	049º GEO 050º MAG	2187M X 45M	PCN 47 R/B/W/U ASPH	114025.8953N 1222208.1095E	09.039M/29.655FT
23	229º GEO 230º MAG	2187M X 45M	PCN 47 R/B/W/U ASPH	114110.1550N 1222259.5220E	05.771M/18.934FT

  - ✓ In addition, all relevant data for Procedure Design purpose should be gathered:
    - Runway, obstacles
    - Controlled airspace
    - Restricted airspace
    - Airways
    - Existing procedure
    - Entry/Exit points
    - Noise sensitive area
    - Radar/Non Radar
    - Atmospheric conditions / Turbulence area



Step 3 – Conceptual Design

- Using all previous gathered data, a Conceptual Design maybe drafted

  - ✓ RW23
  - ✓ RW05

Step 3 – Conceptual Design – RW23

- Using all previous gathered data, a Conceptual Design maybe drafted

✓ **RW23**

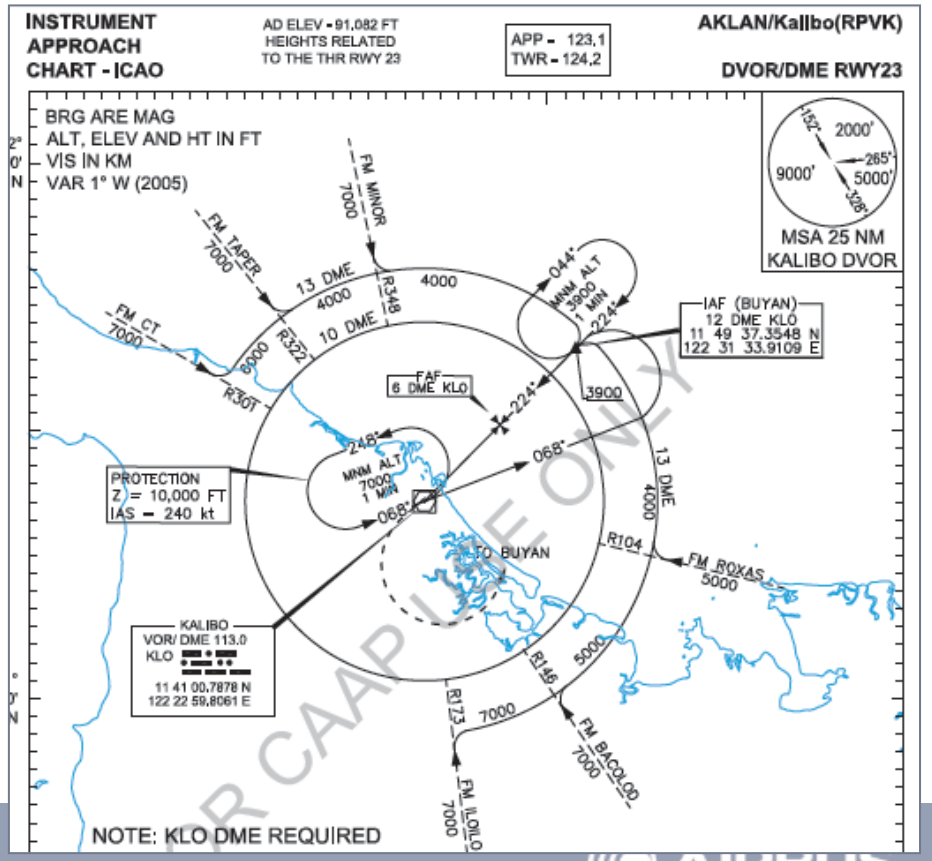
✓ **Proposed solution ?**

✓ **Nav Spec?**

✓ **Proposed Design?**

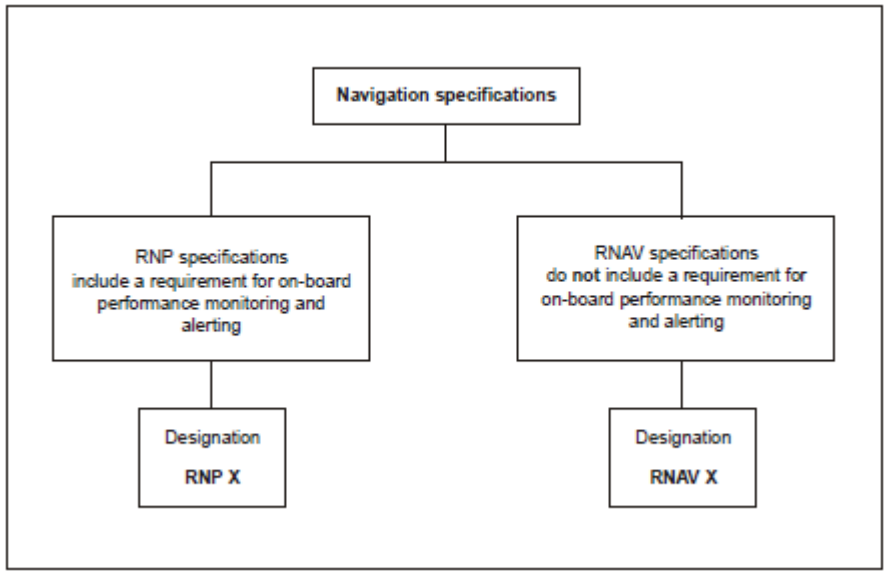
Step 3 – Conceptual Design – RW23

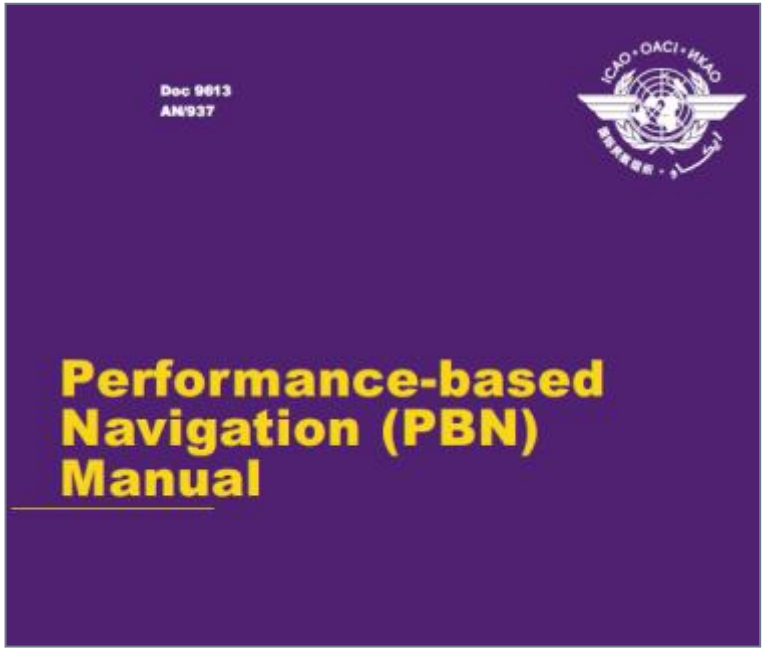
- Reminder of RW23 Existing procedures
  - ✓ **VOR/DME**
    - **Reliability of Ground Navaid?**
    - **NDB coding?**
  - ✓ **RNP procedure**
    - **No Ground Navaid**
    - **Coded in NDB *(ARINC424)***
  - ✓ **Which Nav Spec? Which Design?**



Step 3 – Conceptual Design – RW23

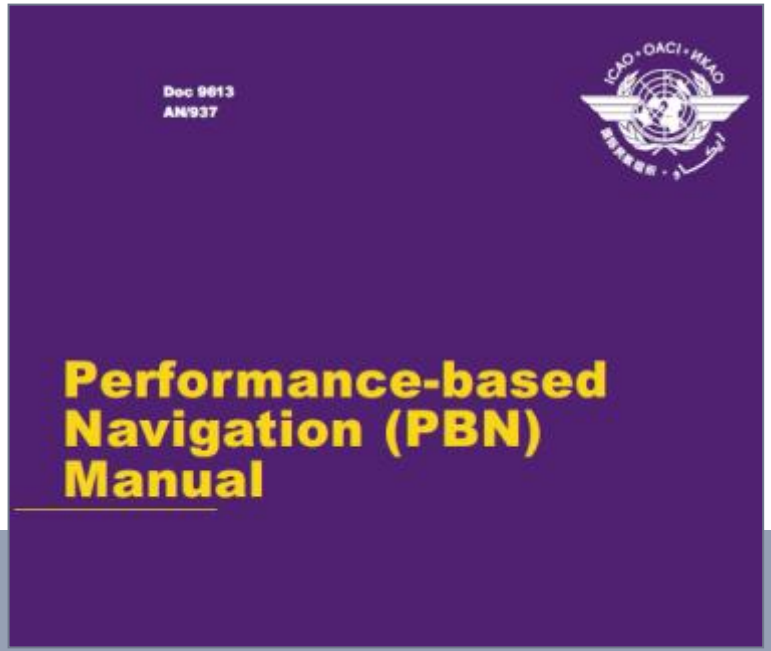
- Non Radar Environment
  - ✓ RNP Procedure required (No RNAV)





Step 3 – Conceptual Design – RW23

- Non Radar Environment
  - ✓ RNP Procedure required (No RNAV)
  - ✓ RNP-APCH approach
    - Basic capability for most aircraft type
    - Basic crew training
    - Fully coded procedure in NDB
    - LNAV & LNAV/VNAV minima



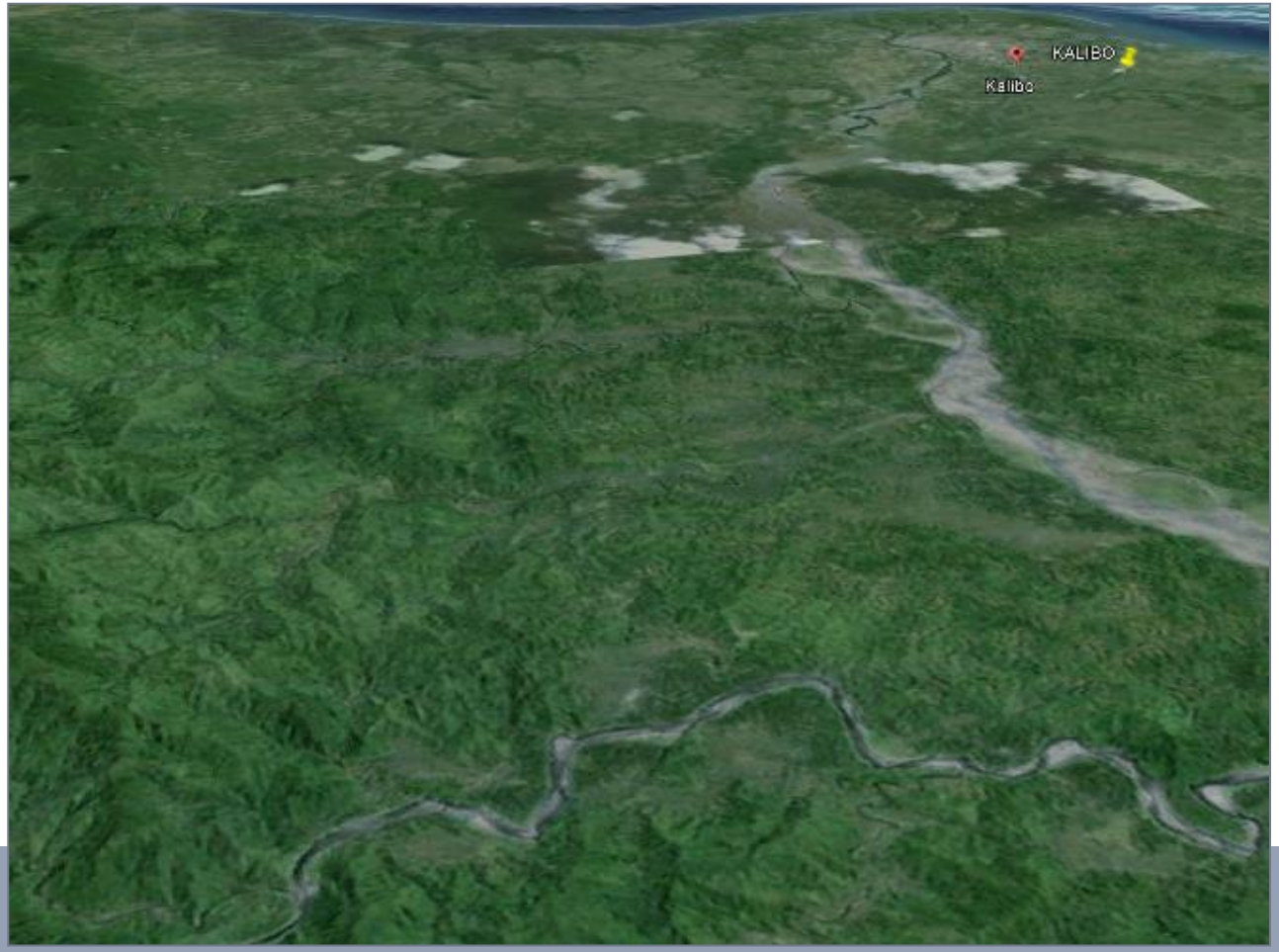
Step 3 – Conceptual Design – RW05

- Using all previous gathered data, a Conceptual Design maybe drafted

- ✓ **RW05**
- ✓ **Proposed solution ?**
- ✓ **Nav Spec?**
- ✓ **Proposed Design?**

Step 3 – Conceptual Design – RW05

- RW05
- High Terrain located West – South West of Kalibo



Step 4: Stakeholders review

Once approved by the below persons, this document is the reference for the detailed design and validation phase (execution phase).

Written by:	
Checked by:	
Approved by:	
Approved by:	
Approved by:	
Approved by:	
Approved by:	
Approved by:	
Approved by:	
Approved by:	
Approved by:	

Issue	Date	Review description
1.0		
2.0		

Step 5 to 8

- Step 5: Apply criteria
- Step 6: Documentation
- Step 7: Safety Assessment
- Step 8: Validation
- Step 9: Consult with stakeholders

- CAA not in charge of these phases (except for specificities) but may be expected to provide inputs

- See what was presented yesterday

Step 10: Approval

- What do you expect to receive as approver?

Idée cherchées ensemble

- Dossier technique
- Etude de sécurité
- Rapport / dossier de validation
  - Validation sol, avant vol, simulateur/vol (si nécessaire)
  - Déclaration de conformité
- (si besoin: Coneptual design = maquette)

Step 10: Approval

- What do you expect to receive as approver?
  - Rapport technique
    - Data
    - Critères
    - MSA
    - Design, Etc.
  - Proposition de carte
  - Proposition de codage
  - Rapport de validation
  - Certification du concepteur
  - habilitation du fournisseur des données / des sources utilisées (déjà à travers le document de spécification du projet – conceptual design-?)
  - Habilitation du Pilote pour la validation
  - Etude ou dossier de la sécurié

The technical report includes:

ICAO AFPP

- Applicable design criteria;
- Data sources and set of input data used for the design (airport, terrain, obstacles);
- All calculations including transformation parameters used;
- All design parameters used (speeds, bank angles, wind velocity, temperature, descent / climb gradients, height loss, obstacle assessment surface (OAS), etc.);
- Any deviation from selected criteria including justification and link to validation as required;
- Full design rationale, construction details;
- Design assumptions and constraints;
- Document version and date;
- Draft elements for publication including chart and coding table as applicable;
- Any other pertinent points of interest resulting from the FPD process, e.g. software tools used for the design, advantages and drawbacks of the assessed scenarios.

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