

# **New ICAO Annex 15 / PANS-AIM Data Quality Requirements**

**MIDANPIRG AIM SG/5  
Cairo, 22-24 January, 2019**

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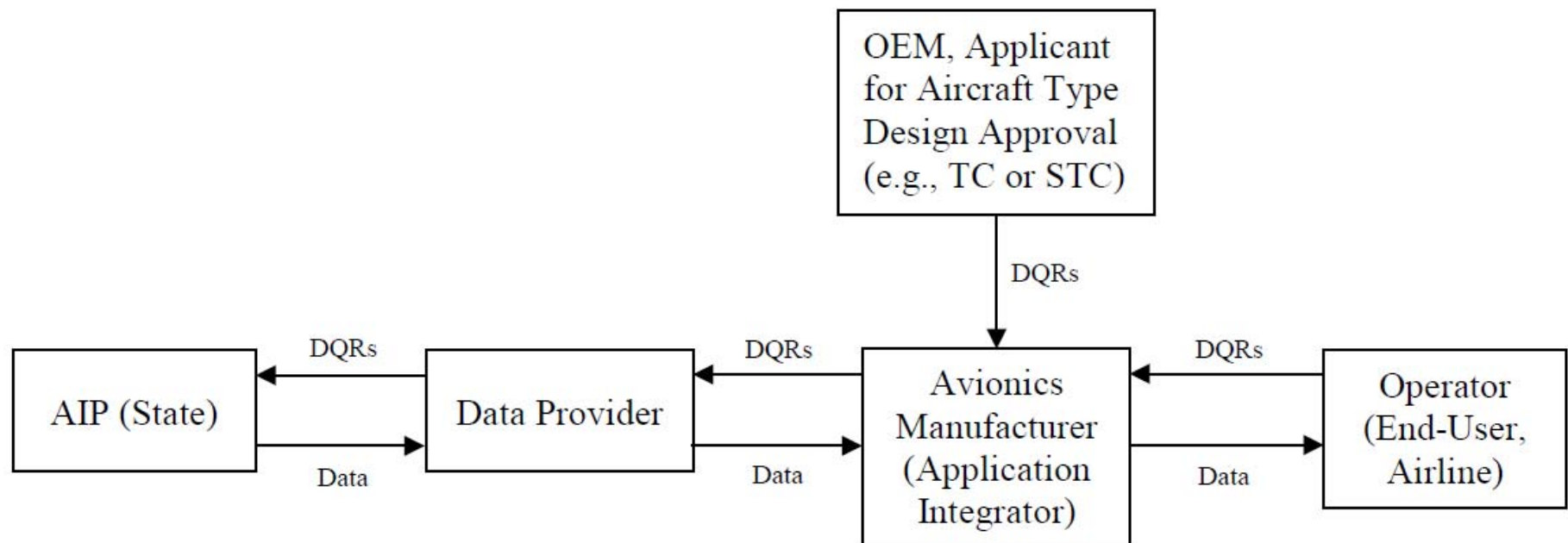


# Data Quality Requirements in New Annex 15

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**DQRs come from the users.**

**Figure 1. Typical Aeronautical Data Chain**

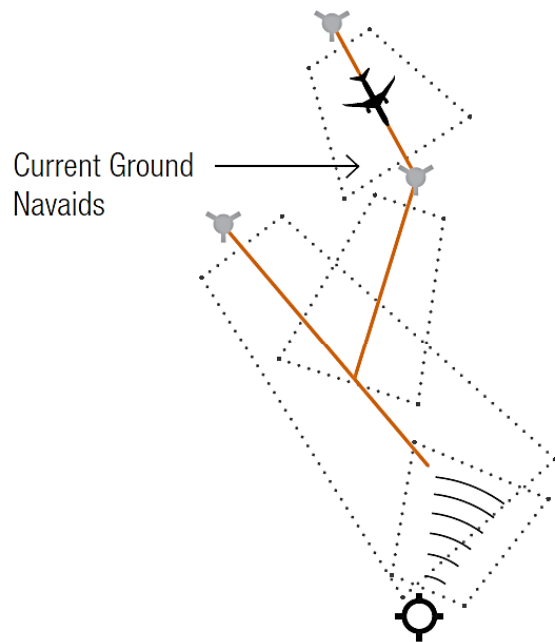


# Required Navigation Performance

## ***Required navigation performance (RNP):***

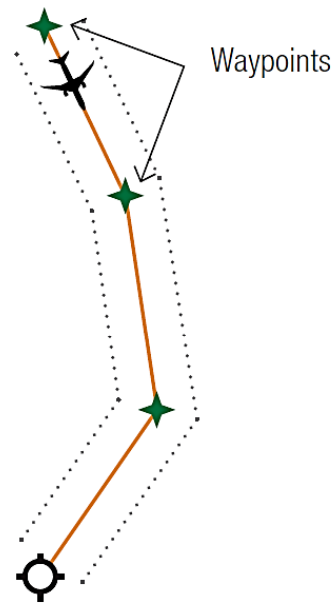
*“A statement of the navigation performance necessary for operation within a defined airspace.” – ICAO Doc 4444 PANS-ATM*

Conventional Routes



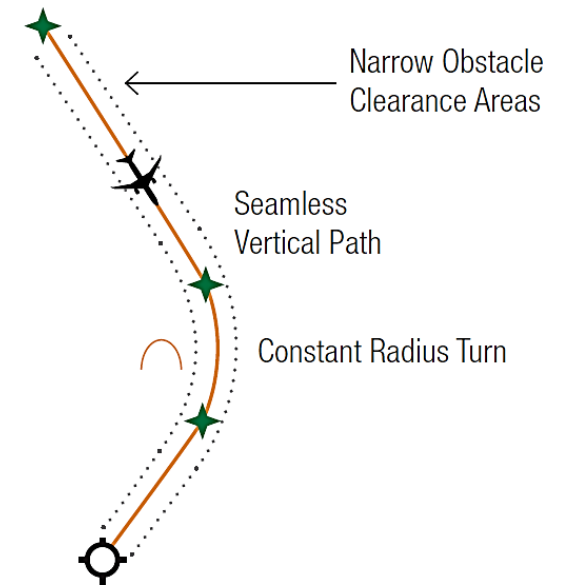
Limited Design Flexibility

RNAV



Increased Airspace Efficiency

RNP



Optimized Use of Airspace



## RNP Approach requires highest quality data

Why is accuracy and resolution so critical in PBN, especially RNP ?

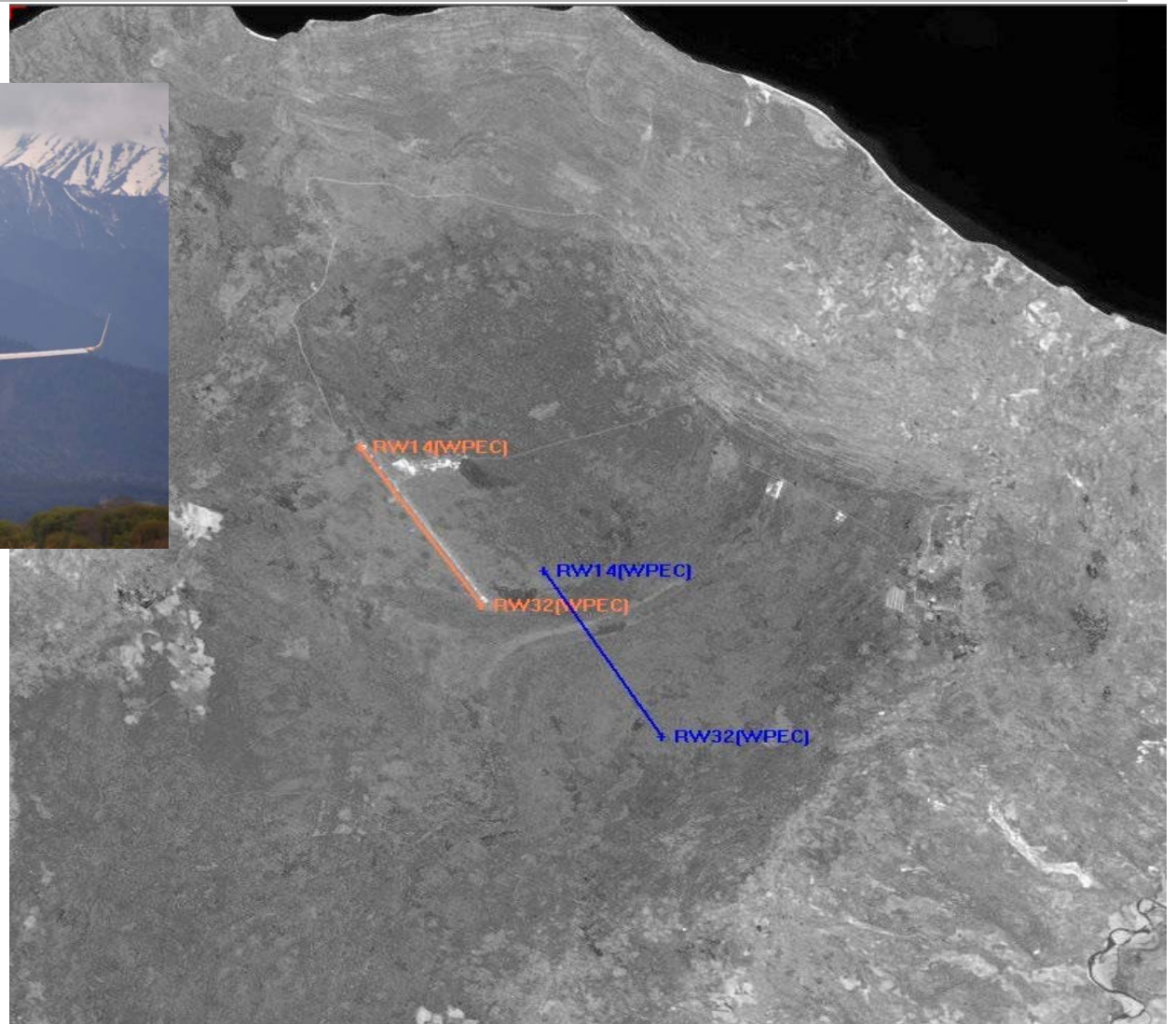
### Conventional Procedure

- Truth is an ILS beam
- The airplane flies a ground based signal that is always in the same position relative to the runway

### RNP Procedure

- Truth is the database
- The airplane flies to the waypoint in the database, right or wrong

... The airplane flies to the waypoint, right or wrong



Actual Runway  
Location (orange)

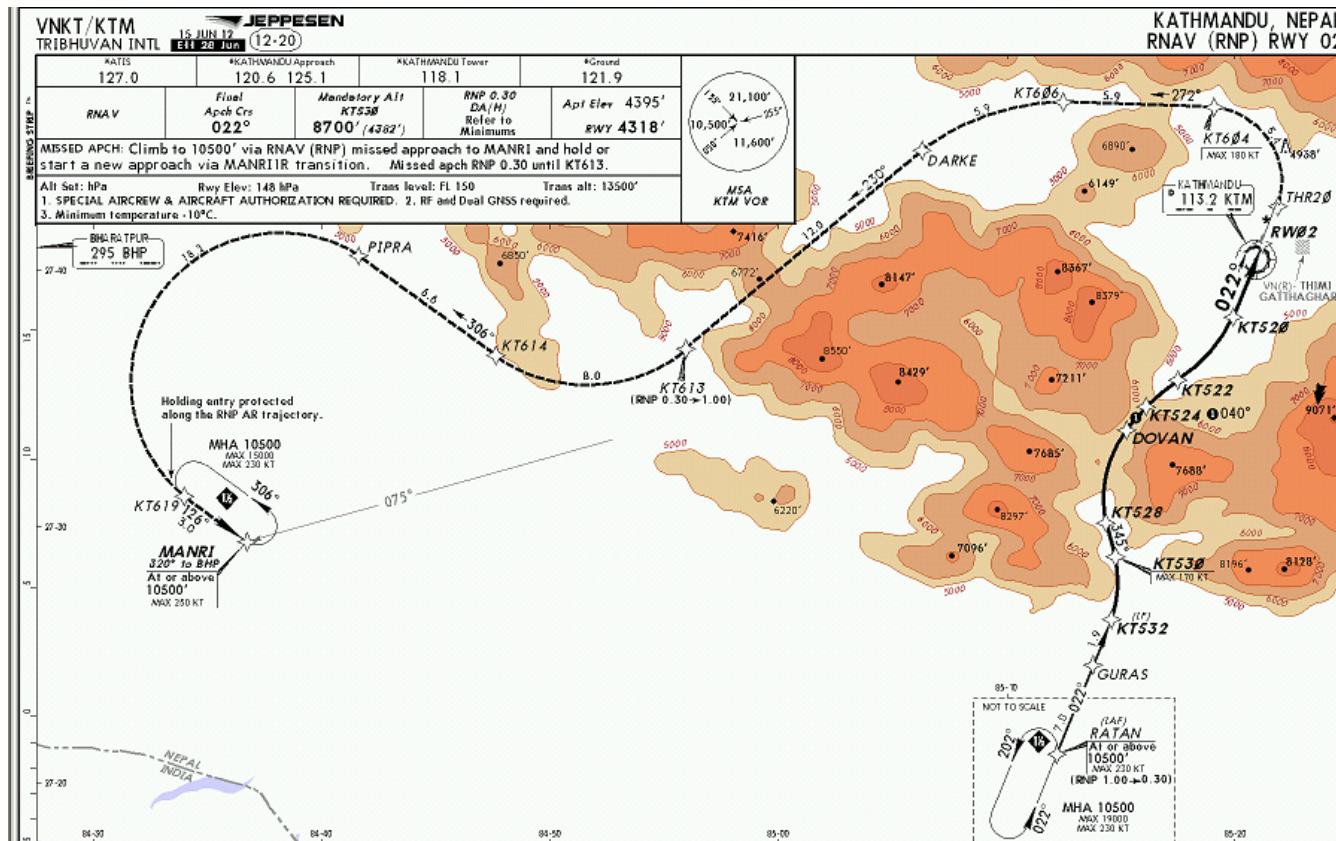
Official AIP Location  
(blue)





# Quality in a PBN World

- Dependent on **accurate data**.
- Nav system provides guidance to **waypoints**.
- Wherever the **database** says they are!
- Data is **mission critical**.



ELEV 1171

RWY 05 THR ELEV 1160

TOWER: 118.1 128.9

**DO NOT USE FOR NAVIGATION**

CAT C,D

APPROACH: 125.75

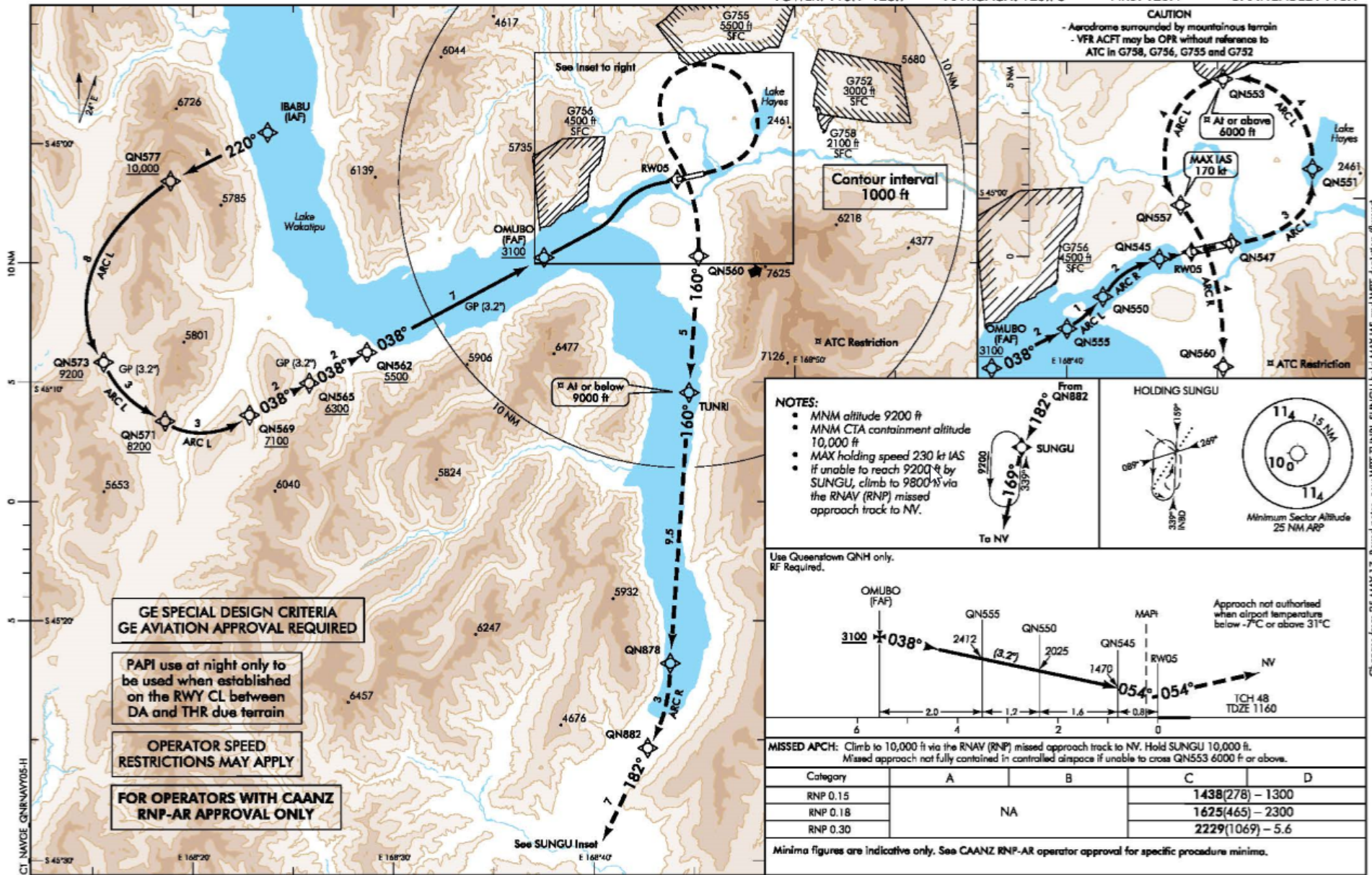
ATIS: 126.4

**QUEENSTOWN**

**RNAV (RNP) Y RWY 05**

UNATTENDED: 118.1

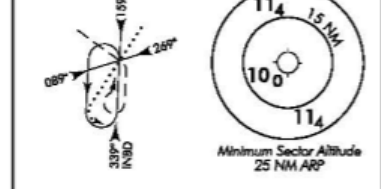
**CAUTION**  
 - Aerodrome surrounded by mountainous terrain  
 - VFR ACFT may be OPR without reference to ATC in G758, G756, G755 and G752



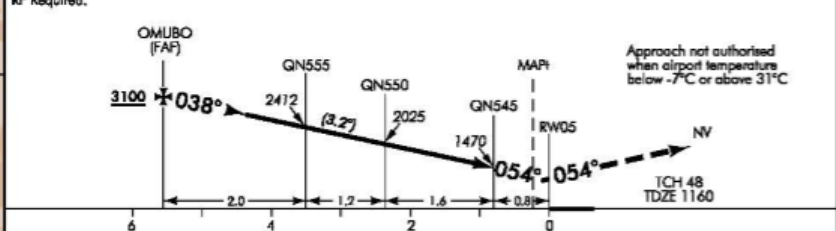
**NOTES:**

- MNM altitude 9200 ft
- MNM CTA containment altitude 10,000 ft
- MAX holding speed 230 kt IAS if unable to reach 9200 ft by SUNGU, climb to 9800 ft via the RNAV (RNP) missed approach track to NV.

**HOLDING SUNGU**



Use Queenstown GNH only. RF Required.



**MISSED APCH:** Climb to 10,000 ft via the RNAV (RNP) missed approach track to NV. Hold SUNGU 10,000 ft. Missed approach not fully contained in controlled airspace if unable to cross QN553 6000 ft or above.

Category	A	B	C	D
RNP 0.15	NA		1438(278) - 1300	
RNP 0.18	NA		1625(465) - 2300	
RNP 0.30	NA		2229(1069) - 5.6	

Minima figures are indicative only. See CAANZ RNP-AR operator approval for specific procedure minima.

<https://vandex.ru/video/search?filmId=18077642699709443842&text=queenstown%20airport%20RNP%20video&noreask=1&path=wizard>

**Effective: 9 NOV 17**

Changes from 25 MAY 17: Based notes, new WPT TUNRI, SUNGU hold MAX IAS and WPT depiction (flyover).



# Data Quality Requirements in New Annex 15

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## 3.6 Quality management system

3.6.1 Quality management systems shall be implemented and maintained encompassing all functions of an AIS, as outlined in 2.2. The execution of such quality management systems shall be made demonstrable for each function stage.

*Note.— Guidance material is contained in the Manual on the Quality Management System for Aeronautical Information Services (Doc 9839).*

3.6.2 **Recommendation.**— *Quality management should be applicable to the whole aeronautical information data chain from data origination to distribution to the next intended user, taking into consideration the intended use of data.*

3.6.3 **Recommendation.**— *The quality management system established in accordance with 3.6.1 should follow the ISO 9000 series of quality assurance standards, and be certified by an accredited certification body.*



# Data Quality Requirements in New Annex 15

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- **2.1 State Responsibilities**
- 2.1.4 Each Contracting State **shall** ensure that the aeronautical data and aeronautical information provided are complete, timely and of required quality in accordance with 3.2
  
- **3.2 Data quality specifications**
  - 3.2.1 Data Accuracy
  - 3.2.2 Data Resolution
  - 3.2.3 Data Integrity
  - 3.2.4 Data **Traceability**
  - 3.2.5 Data **Timeliness**
  - 3.2.6 Data **Completeness**
  - 3.2.7 Data **Format**



# The Aeronautical Data Catalogue

(Appendix 1 of PANS-AIM)

Table A1-2 Airspace data

Subject	Property	Sub-Property	Type	Description	Note	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
ATS Airspace				Airspaces of defined dimensions, alphabetically designated, within which specific types of flights may operate and for which air traffic services and rules of operation are specified.						
	Type		Text	Type of ATS airspace according to ICAO Annex 11.						
	Name		Text	The designator given to an airspace by a responsible authority						
	Lateral limits		Polygon	The surface defining the horizontal shape of the Airspace		see Note 1)				
	Vertical limits									
		Upper limit	Altitude	The upper limit of the airspace						
		Lower limit	Altitude	The lower limit of the airspace		50 m	routine	calculated	50 m or 100 ft	50 m or 100 ft
	Class of airspace		Code list	A categorisation of airspace which determines the operating rules, flight requirements, and services provided, as indicated in Annex 11, Section 2.6 and Appendix 4						



*The Data Catalogue is a general description of the AIM data scope and consolidates all data that can be collected and maintained by the aeronautical information service. It provides a reference for aeronautical data origination and publication requirements*

# Data Quality Requirements in New Annex 15

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## 3.2.4 Data Traceability

3.2.4.1 Traceability of aeronautical data shall be ensured and retained as long as the data is in use.

## 3.2.5 Data Timeliness

3.2.5.1 Timeliness shall be ensured by including limits on the effective period of the data elements.

*Note 1.— These limits may be associated with individual data elements or data sets.*

*Note 2.— If the effective period is defined for a data set, it will account for the effective dates of all of the individual data elements.*

## 3.2.6 Data Completeness

3.2.6.1 Completeness of the aeronautical data shall be ensured in order to support the intended use.

## 3.2.7 Data Format

3.2.7.1 The format of delivered data shall be adequate to ensure that the data is interpreted in a manner that is consistent with its intended use.

# Data Quality Requirements in PANS-AIM

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## CHAPTER 2. AERONAUTICAL INFORMATION MANAGEMENT

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### 2.2 Data integrity monitoring and assurance

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*Note.— Guidance material in respect to the processing of aeronautical data and aeronautical information is contained in **RTCA Document DO-200B** and **European Organization for Civil Aviation Equipment (EUROCAE) Document ED-76A — Standards for Processing Aeronautical Data.***



# Data Quality Requirements in RTCA DO-200B

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## Format

The format characteristic refers to the data structure. **The format of delivered data should be adequate to ensure the data is interpreted in a manner consistent with the intent of the data.**

For transmission or upload, two potential formats are available for aeronautical data: human readable or digital. With the advent of cross-industry standardization, highly structured mark-up languages, such as the Extensible Markup Language (XML) tend to replace the simpler human-readable formats based on position in the row/column (e.g., ARINC 424) or field separators (e.g., NOTAM format).

There is also a trend for the definition of conceptual/logical data models from which the data coding specification is derived. This facilitates the use of different coding formats, adapted to local needs, while ensuring interoperability through a common semantic model.

# Data Quality Requirements in PANS-AIM

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## CHAPTER 2. AERONAUTICAL INFORMATION MANAGEMENT

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### 2.1.2 Processing

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*Note 3. —Supporting data quality material in respect of data accuracy, publication resolution, and integrity of aeronautical data, together with guidance material in respect to the rounding convention for aeronautical data, is contained in Radio Technical Commission for Aeronautics (RTCA) Document DO-201A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-77 — Standards for Aeronautical Information (or equivalent).*

# Data Quality Requirements in RTCA DO-201A

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## 2.4.5 Volume of Changes for a Single AIRAC Cycle

Planning authorities need to be aware that **major changes** such as a re-design of the State's airspace **can place large demands on the aviation industry** if the changes are scheduled for a single AIRAC cycle. This is more severe when the re-design effects TMA, arrival and departure routes in addition to a large number of en route airways. There remain many **RNAV systems with fundamental limits to their database storage capacity** that restrict the volume of change that can be held in an on-board database. Where large volumes of changes are anticipated by the State, it is requested that **close coordination be maintained with the users** to ensure that the new data can be adequately incorporated into industry systems. In addition, **earlier distribution of the changes will also assist in resource scheduling.**

**THANK YOU!**

